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A. INTRODUCTION

WHAT DOES THIS GUIDANCE DO?

1. This guidance provides advice for employers on setting up a safe system of work for the organisation and management of a pop concert or other similar kind of event. If it is followed it should help reduce the risks to the health and safety of workers and members of the public. The guidance was produced by the Health and Safety Executive and the Home Office with the help and support of local authority inspectors who had experience of these kinds of events. It has also drawn on the experience and expertise of concert promoters, licensees, specialist contractors and others.

2. For the purposes of the guidance, a pop concert is an event where live or recorded music of a modern popular nature is performed by solo or group artistes, before a live audience.

3. Whilst the phrase "pop concerts" is used throughout, the guidance can also apply to a concert given by classical musicians, and is also relevant to other forms of activity where music is reproduced, particularly in open sites where the infrastructure to run an event has to be brought in and set up.

4. The guidance examines the behaviour of the audiences which different types of pop groups attract. This can be a major factor in the management approach and levels of management which may be needed to run the concert safely.

5. There are a number of legal obligations on people who are involved in running pop concerts. There are, for example, specific duties placed on all employers under the Health and Safety at Work etc Act. Many local authorities will licence pop concerts and place specific requirements on their management, organisation and conduct. Appendix 1 examines the legislation which applies to these events.

NOTE: Throughout this guidance the word "employer" is used except where the sense requires specific reference to duty holders such as the licensee or promoter.

6. Under health and safety legislation, a concert promoter, organiser, licence-holder, specialist contractor and venue-owner are all employers. They all have a statutory duty to protect the health and safety of their workers and others who may be affected by their work activity. Employers must assess the hazards which are involved and quantify the risks which these hazards present. Wherever possible, hazards should be removed; if they cannot be removed, then they must be managed so that they do not present risks to the health and safety of workers and members of the public. This management might include, for example, the use of protective equipment such as ear defenders or the provision of a safety barrier in front of the stage.

7. Most health and safety legislation is qualified by the duty to take action "so far as is reasonably practicable". 'Reasonably practicable' means that the time, trouble, cost and physical difficulty of taking measures to avoid the risk are not wholly disproportionate to it. The size or financial position of the employer is not taken into account in this calculation. Under licensing law, a different concept applies. The licensing authority may impose conditions which are governed by a duty of "reasonableness". This means that it can impose requirements that will achieve higher standards than those required under health and safety legislation.

8. Generally pop concerts take place with few incidents and this is largely due to the successful management of them. They can present quite considerable hazards however and these are described within the body of the guidance. The number of pop concerts is increasing and there is growing technical complexity and this guidance will help employers to mount successful and safe concerts in the future.

SUMMARY OF PRINCIPAL RECOMMENDATIONS

1. Concerts should have an Event Safety Officer with responsibility for implementing safety procedures (page 18).

2. For large concerts, Event Planning Meetings should be held to involve all those with an interest at the earliest possible stage (page 19).

3. Local authorities should nominate a single officer to co-ordinate all their interests at the Event Planning meeting (page 20).

4. Good traffic planning and management is essential. Wherever possible the use of private motor vehicles should be discouraged by the provision of effective and frequent public transport. The police should be involved in plans for traffic management at an early stage (page 27).

5. Entry and exit points should be kept clear of permanent and temporary obstructions, be clearly signposted and operate efficiently (page 34).

6. The maximum number the site or venue will hold must be established and all necessary steps taken to ensure that this figure is not exceeded (page 38).

7. The admission of young children to concerts should be carefully considered because of their vulnerability. Prams and pushchairs should not be allowed into venues unless the hazards they can create are carefully evaluated and the necessary arrangements made to deal with them (page 38).

8. Where the audience is likely to be predominantly under the age of 16, concerts should be all-seated (page 40).

9. Front of stage barriers play an important part in crowd management.. They should comply with a minimum loading standard of 5kN/m right-angle load at a height of 1.2m (page 49).

10. Penning of audiences in flat, open areas should not be permitted. Multi-barrier arrangements for containing crowds can be considered in suitable circumstances but careful monitoring of crowd numbers should take place if they are to be used (pages 51-52).

11. A survey should be held before concerts to identify the number of stewards that will be needed and the areas they will cover (page 54).

12. Stewards should be readily identifiable, operate according to set procedures under a hierarchical command structure, and be fully competent in the nature of the event they are to steward (pages 57-58)..

13. At major events, an emergency services office should be provided for use as a decision-making area for key personnel involved in the event (page 65).

14. Suitable arrangements should be made to ensure disabled people can attend concerts. This will need to include easy access and adequate means of escape (page 69).

15. Staging and temporary structures must be safely constructed to strict criteria and examined against those criteria by a competent person. Workers undertaking the construction and dismantling of structures must be competent, properly trained and supervised (page 77).

16. Lasers may need to be under the direct control of a designated safety officer (page 106).

17. If strobe lighting is used, the flicker rate should be below 4 flashes per second (page 107).

18. Pyrotechnics should be under the control of a designated competent person. Prior consent for their use should be obtained from the licensing authority (pages 109-110).

19. The use of delay towers to distribute sound around the arena is an effective means of reducing the exposure to high sound levels of the audience and employees (page 115).

20. Over the duration of an event, sound levels should not exceed [104dB(A)] in any public area (page 118).

21. If sound levels are likely to exceed [96dB(A)], promoters should ensure that information on potential risks to hearing is given to the audience (page 118).

22. Limits are suggested for the extent to which noise levels measured outside concert venues can exceed normal background noise levels. The limit for each venue depends on the number of concerts taking place there during the year (page 120).

23. Adequate fire precautions should be taken for each event. Potential sources of fire ignition need to be assessed and measures taken to minimise the risk of fire (page 124-126).

24. Organisers of large events should appoint a qualified medical officer to advise on first aid arrangements. Recommendations are made for minimum numbers of first-aid staff at concerts where disorder or other problems are possible (Category A) and other events (Category B) (page 135).

25. An adequate supply of drinking water should be provided for the audience (page 143).

26. Sanitary conveniences must be provided for workers and the audience. Recommendations are made on the number of conveniences (page 145-148).

A SAFE SYSTEM OF WORK

9. It is a legal requirement under the HSW Act that all employers must provide "systems of work that are, so far as is reasonably practicable, safe and without risks to health".

10. A safe system of work is a method of doing a job which eliminates identified hazards, controls others and plans to achieve the controlled completion of the work with minimum risk. A safe system may include a range of precautions from simple procedures and protective equipment through to a full written permit to work. It requires a systematic, imaginative analysis of the job and its hazards. The analysis should be practical and incorporate lessons learned from past experience.

11. All the operations involved in the staging of a pop concert should form part of a safe system of work. The promoter and licensee will have a particularly important role in ensuring that this is the case. All those who employ people or permit non-employees access to a work area must ensure that their operations form part of a safe system.

12. There are five steps which need to be taken in setting up a safe system of work:

- assessing the task, which involves taking account of what is used, who does what, where the task is carried out and how the task is to be done;

- identifying the hazards and assessing the risks;

- defining safe methods;

- implementation;

- monitoring.

This guidance is designed to help employers establish a safe system. The structure of the guidance is designed to deal with these areas as follows:

Part B:	Assessing the task
Part C:	Identifying the hazards, assessing the risks and defining safe methods
Part D:	Implementation
Part E:	Monitoring.

B. ASSESSING THE TASK

13. In promoting and running a pop concert and other similar kinds of event, the employer needs to assess what is involved. This can be done under the following 3 broad headings:-

evaluating the event;
evaluating the site;
assessing the infrastructure;

EVALUATING THE EVENT

Venue

14. In evaluating the event, the employer should review the infrastructure which is needed to get concert audiences to and from the event and this is dealt with in more detail below. The venue itself may be an established theatre, hall, stadium or an open air site or a combination of these. With an established stadium or theatre, the ability to adapt the site may be more restricted than, for example, with a green field site where there is much greater scope for regulating the positioning, design and layout of events.

15. As part of the management of the audience, the use of stands and viewing platforms may form an important feature. This is true for both indoor and outdoor concerts.

Size of Concert

16. The local authority may regulate the size of the concert through its licensing requirements. It may also stipulate maximum crowd densities in different parts of the venue. Security printed tickets may be required, to prevent forgeries, and an audited account of the number of tickets sold may be necessary as a control check on the size of the audience. On grounds of safety, the local authority may insist that tickets are issued even for so-called "free concerts" in order to assist with the proper management and control of the event.

17. It is a key feature in the safe management of any concert that the employer should know the size of the audience as this will help determine what needs to be done to manage the concert safely.

Nature of Performers and their audiences

18. In assessing a concert, the principal performer(s) may be supported by other artistes who may attract a different kind of audience. The characteristics of all those taking part in the concert need to be carefully evaluated and taken into account in dealing with the risks which they can present.

19. The information which an employer can obtain from the performers' agents about the likely audience profile and previous behaviour of audiences attending concerts at which the performers have played, will provide a valuable basis for assessing the implications for crowd control. For example, "heavy metal" groups tend to attract a predominantly young male audience with an average age of somewhere between 17-22. Other groups may attract a younger audience. With young audiences, there may be particular problems to be addressed, for example, hysteria, "slam dancing" (in which individuals throw themselves against other members of the audience) and diving from the stage. Other audiences may tend to indulge in heavy alcoholic drinking and the risks that drunken behaviour may present, both as regards physical violence and in lack of discipline, will need to be taken into account.

20. The behaviour of the performers may have a considerable influence on their audiences and, for example, jumping into the audience or throwing items from the stage, can lead to crowd surges and consequential crushing injuries. The concert promoter should establish, on the basis of previous experience, whether the performance itself, either through the way it is staged or carried out, could have health and safety implications.

21. The assessment of the concert performers and their audience may have implications for the numbers of people who may be admitted; the density of people who may be admitted to particular areas; the need for a crowd barrier around the stage;the design and construction of any barrier that may be needed; the numbers of stewards who may be needed; first aid facilities; etc.

Length of Concert and its impact

22. The length of the concert will have direct implications for the health and safety measures which an employer should take in respect of his employees. This can be critical, with regard to noise levels, for example. It will also have implications for the infrastructure that will be needed as well as, for example, the need for relief workers if they are required to work in high temperatures.

23. The length of the concert will also have direct implications for: the provision of sanitary conveniences; the arrangements for dealing with refuse; and the provision of drinking water and other amenities.

24. The major impact of the length of the concert for the local community will be the environmental noise as well as the disturbance caused by concertgoers' access to the site and the effects of local parking arrangements. It may also be necessary to close off certain access roads for crowd control purposes. In any approach to the local authority for a licence, these factors will need to be borne in mind. The local authority may well feel that there is a need to seek the views of local residents and local residents' associations and those views may weigh heavily in the balance as to whether the Council is prepared to grant a licence for the concert.

EVALUATE THE SITE

Type of Site

25. Even with a permanent site, temporary adaptations may be needed in order to accommodate the pop concert or supporting entertainment. With a temporary site, considerable adaptation will almost certainly be needed and the supporting infrastructure to stage the concert will need to be imported.

Temporary structures

26. If it is decided to use temporary stands and viewing platforms their siting, both as regards the ability of the ground to take the load and line of sight to the stage, will be critical factors.

27. The ability of the temporary stands and viewing platforms, where located outside, to withstand and deal with adverse weather conditions will be important.

28. In any evaluation of the site the location of marquees, tents and other temporary structures needs to be carefully assessed. They should wherever possible be kept away from access and exit points and should not be erected at areas exposed to adverse weather conditions. They should be positioned on level ground that is not likely to flood in the event of bad weather. Their position on the site layout should be clearly identified and the position on the ground should be clearly indicated prior to any assembly.

Emergency Access and Egress

29. Access and egress to and from the site, both whilst the concert is being set up and whilst it is in progress, will need to take particular account of the needs of the emergency services. Generally, a route should be reserved solely for the use of the emergency services in order to provide quick access in case of need. Within the site itself, there needs to be for a special route which can allow easy access for the emergency services and their vehicles to all parts of the site.

Surrounding Areas

30. The impact of the concert on the surrounding area needs to be taken into account. For example, a particular pop group may attract an audience which is associated with drunken or violent behaviour and, where this is foreseeable, this will need to be taken into account by employers so that they can satisfy their statutory duty to do everything reasonably practicable to protect health and safety. The surrounding area may need to be assessed for remote car-parking facilities. The local transport systems available to get people in and out of the site should be identified.

Ground Conditions

31. In dealing with open field sites, weather conditions may have considerable implications on how the concert is staged. For example, in certain cases, the ground may become waterlogged very quickly and muddy conditions may create slipping and falling hazards which otherwise might not exist. In cases such as

this, there will be a need to provide temporary roadways and to take other measures to deal with the risk. Moreover, if a heavy stage and other temporary structures are to be erected, the ground loadings will need to take into account a variety of weather conditions so that, even in the most adverse conditions, the temporary structures remain stable.

32. In wet conditions, slopes on sites will become increasingly dangerous. Wherever possible, steep slopes should be eliminated. Where this is not possible, preventive measures should be taken, for example by the provision of handrails or other means of support.

Stewarding

33. Stewards may be needed to direct crowds to the site from, for example, local railway and bus stations. There will need to be stewards at the ticket barrier points to the site and to manage any car-parking arrangements to ensure that cars and vehicles are parked orderly and according to plan. There may need to be different tiers of control within the concert itself. For example, stewards will be needed at any front of stage barrier to ensure that distressed concertgoers are lifted out of the crowd and receive first aid. They will also be needed in front of stage to prevent the audience climbing onto the stage. Additional controls may be needed at the back of stage. Pop groups may have their own security arrangements to ensure they are not troubled by over-enthusiastic fans.

Police

34. Police will be needed to direct traffic on the public roads, and on the site to deal with public order matters and any criminal behaviour.

Layout of site

35. For outdoor concerts, a drawing should be provided to the local authority showing the layout of the site. This should include location of all structures, access and egress points, as well as the provision and distribution of services, such as electricity, gas and water. Where bottled gas supplies are to be used, arrangements will need to be made for correct and proper storage.

36. The access and egress points should be situated away from temporary stands, tents, marquees etc. Electrical and water services should be routed to avoid both deliberate and accidental damage. The stage, and other temporary structures such as stands for TV cameras and loudspeakers will need to be sited on ground which can support the load and, so far as is reasonably practicable, away from prevailing winds.

Traffic Management

37. The local police should be advised at an early stage about the proposed routes for traffic access and egress to and from the site. This should generally be away from centres of population. The police will also need to be consulted about the signposting of these routes and contact with the motoring organisations may be desirable. The provision of car and coach parking facilities may depend on the type of concertgoer the concert is likely to attract. A concert which attracts a younger audience may generate more motor cycles and fewer cars although the cars may have more passengers. With particularly young audiences, drop-off points may be necessary.

38. Car parks will need to be carefully laid out and should be signposted and labelled in order to prevent traffic jams and to enable car owners to find their vehicles at the end of the concert. The location of suitable available car parks and facilities could be indicated on tickets or in advertising for the concert.

39. Within an open site, traffic presents a serious risk to concertgoers and so, wherever reasonably practicable, the two should be separated. Access of vehicles to the site should be limited and only allowed under stringent controls and supervision.

ASSESSING INFRASTRUCTURE

40. In assessing the infrastructure, the existing arrangements need to be taken into account first so that any additional requirements can be assessed and their effect fully taken into account.

Stage

41. Many groups on tour use their own portable stages and this will need to be carefully assessed as it may have an effect on floor or ground loadings. Where an existing stage has to be adapted, the effect of superimposed loads and stresses needs to be assessed. In all cases, a competent person should be employed to check designs, and load and stress calculations.

Stands and Seating

42. Loading calculations for stands and viewing platforms will need to take account of both static and dynamic loads. Whilst, for example, a stand may be capable of withstanding a static load of a capacity audience, it may not be capable of withstanding the dynamic load of a young audience jumping up and down.

43. Where the stands and viewing platforms are already provided in a permanent establishment, they will need to be reassessed in the light of the likely characteristics of the audience who will either use or have access to them. Where temporary seating stands are provided, a competent person should be employed to check the ground load calculations and the stresses in the structure.

Tents and marquees

44. Tents and marquees may be needed for refreshments; first-aid; sleeping accommodation; shops eg selling souvenirs and franchise goods; police and emergency services; contact points. The purpose for which these tents and marquees are to be used will need to be assessed and suitable types and designs provided. They should meet the appropriate flammability standard. The major hazards associated with temporary structures such as tents and marquees are stability, tripping hazards associated with guy ropes and flooring and fire.

Electrical Arrangements

45. Electrical power will be needed on the stage for lighting, for the musical instruments and special effects. Power may also be needed for amplification, computers and other purposes. The power demands, voltages, electrical amperage and frequencies of alternating current supplies should be assessed so that the

correct supplies are provided. Arrangements must be made to ensure that power generated from different sources does not cross. Electrical supplies will also be needed on site for lighting (both permanent and emergency). Routing of electrical cables should be carefully planned. A balance has to be struck between the numbers of different power sources and the length of electrical distribution arrangements.

Lighting

46. Lighting may be needed both inside and outside the site. Within the site or venue, lighting will be needed to ensure that the crowd can enjoy the concert in safety. Lights will also be needed to illuminate the exits and exit signs.

47. There must be an emergency lighting system run independently of the main system and relying on a different power source.

48. Lighting is required on stands and any staircases. It will also be needed in the car parks to enable members of the audience to see to park their cars safely and to find them after the concert.

First Aid

49. First aid facilities should be provided at all concerts. It is a statutory requirement for employers to provide first aid facilities for their workers under the Health and Safety (First-Aid) Regulations 1981.

50. First aid will need to be provided to deal with cases of fainting and hysteria. With larger audiences, first aiders can expect to have to deal with epileptic fits and diabetics with insulin reactions or problems caused by lack of insulin. For open air concerts, problems caused by heat stroke, dehydration, bee and wasp stings, hay fever and asthma attacks are foreseeable. First-aiders may also have to deal with alcohol poisoning, fractures, severe bruising, cuts and drug overdoses.

51. Competent and trained first-aiders will be needed. Qualified medical staff, including doctors and nurses, and resuscitation equipment may be stipulated by the local authority as a licence condition.

Fire

52. The kind of fire risk will need to be identified and suitable extinguishers provided. Fire-fighting equipment, particularly extinguishers, will be needed adjacent to potential fire sources. Where suitable water supplies are unavailable the fire emergency services may require tanks of water.

53. The Fire Services need to be consulted at an early stage in the planning of any pop concert.

C. IDENTIFYING THE HAZARDS, ASSESSING THE RISKS AND DEFINING SAFE METHODS

54. This Section deals with the identification of the hazards that may arise with a pop concert. Some hazards will be more dangerous than others. Wherever possible hazards should be removed. Where they cannot be removed, they will need to be effectively controlled.

55. Planning and management is an essential requirement for safety.

PLANNING AND MANAGEMENT

Responsibility

56. Organisers of pop concerts have the primary statutory responsibility for ensuring the health, safety and welfare of those engaged in work activities before, during and after the event. They also have the primary statutory responsibility for the health and safety of the audience attending the concert. They must ensure therefore that there are adequate standards of health and safety both within and around the site, insofar as it is under their control to any extent. For all the work activities that take place employers must ensure that everything reasonably practicable is done to ensure the safety and health of workers and members of the public. They must also ensure that there is effective management of the 'human factors' associated with crowd safety.

57. In some instances, the promoter will organise the entire event but in the case of most major events, the promoter will not be the licensee. Ultimately, the licensee is responsible for meeting the terms and conditions of licence. However, certain responsibilities may be delegated quite properly to the promoter, such as control of the "pit" area in front of the stage.

Organisation and Management Responsibilities

58. Each person involved in the organisation of a concert should clearly understand their responsibilities and how their role fits into the safety procedures. This should be set down in writing. A line management structure indicating designated responsibilities should be available to all those involved in the organisation of the event.

Enforcing Authority

59. Whilst many departments within the local authority will have responsibilities for the arrangements connected with the event, one person should be responsible for overall co-ordination and should take the lead for all departments' involvement in the pre-planning process. Wherever possible this person should also head the local authority team at Event Planning Meetings (see paragraph 69 below).

Event Safety Officer

60. If they are to eliminate or reduce the risks which are present in holding the event, organisers must have clearly defined procedures for its planning and for the management of safety within and around the site. For each event, the organiser should appoint an individual to have specific responsibility for implementing safety procedures. This person, referred to in this guide as the Event Safety Officer (ESO), should be competent in subjects such as safety management and site safety.

61. ESOs should have specified functions and powers and their reporting relationships to other parts of the organisation should be clearly established.

62. The ESO should be responsible for ensuring that all contractors, sub-contractors and self-employed persons employed on the site are competent. Where there are recognised standards of competency or training, eg fork-lift truck drivers, basic food hygiene certificate, construction industry training board qualification in scaffolding, the ESO should ensure that wherever possible only persons with these qualifications are employed. In cases where untrained workers or workers who do not have the necessary competence are to be used, the ESO should draw the matter to their employer's attention and also to the attention of the organiser. In such cases, where properly trained or competent workers are not available to do the work, either the level of management supervision should be increased so that any risks are properly managed or, where increased management supervision is not possible, the work activity should be stopped until properly competent and trained workers are available.

63. Good communications are extremely important, and the ESO should ensure that the authorised officer/s of the relevant enforcement authority/authorities is/are aware of the date when site preparation commences and the length of time which it is anticipated the work will take.

64. The ESO should carry out any necessary inspections of the site and confirm main verbal instructions in writing.

Event Planning Meeting

65. An early start to the planning of a major event is an essential requirement if hazards are to be identified and the necessary steps taken to protect health and safety for all those concerned. If the planning process is to operate successfully, there needs to be early notification of the event to all interested parties, such as the local authority and the emergency services. An effective system of communications needs to be set up between these parties and organisers should convene a meeting, referred to in this guide as an Event Planning Meeting, to discuss all aspects of concert safety.

66. The ESO should ensure that all relevant safety information, ie drawings, technical data etc are provided to the Licensing Authority, the health and safety enforcement authority and any other body represented in the Event Planning Meetings. If a request from these bodies for specific information cannot be met by the ESO, they should ensure that the information is obtained and given as soon as possible.

67. The concert will normally be held under the terms and conditions of an annual or occasional entertainment licence. If an annual licence has been obtained, the initial Event Planning Meeting should take place at least 28 days prior to the event. If an occasional licence is appropriate, it may be necessary to hold the initial meeting before this has been obtained and it is recommended that it should be held at least three months before the event.

68. The nature of the Event Planning Meeting and the parties who attend will depend on several factors: the venue, the concert, the artistes, the audience expected to attend and the experience of the organiser. Large outdoor and major indoor events require considerable planning and it is likely that more than one meeting will need to be held. In some circumstances an event planning meeting may not be needed. In these circumstances the employer should nevertheless go

through the system described in this guidance and identify hazards, quantify their risks and take the necessary steps, in consultation as necessary with the relevant responsible authorities, to make sure that the risks are properly managed.

69. The initial Event Planning Meeting should be attended by:-

- representatives from the local authority. The organisation of the authority will determine the departments that need to be involved but it is likely that there will need to be representatives of the Environmental Health/Highways/Technical Services/Transport/Building Control Departments. One person should be appointed to lead this multi-disciplinary team to act as the contact point;

- site owner;

- promoter;

- representative(s) of:- (where applicable)

  (a) Police Authority

  (b) Fire Authority

  (c) Health and Safety Executive

  (d) Merchandising Concessionaire

  (e) Catering Concessionaire

  (f) First Aid Organisation

  (g) Security Organisation

  (h) Highway Authority (where this function is carried out by a local authority which is not the enforcing authority for health and safety and licensing, eg the county council authority)

(i) British Rail

(j) British Transport Police

(k) Event Management Organisation

(l) Coach/Car Parking Organisation

(m) National Health Service and Ambulance Service

(n) Motoring organisations.

70. The organiser should ensure that appropriate plans, drawings, calculations and samples of material are submitted prior to the meeting and that the necessary experts are present to answer any questions on these. It may also be appropriate to invite consultants who have been engaged to undertake tasks such as checking structures for stability, loading and wind loading or advising on noise levels.

71. Event Planning Meetings should be formally structured with agendas and be minuted; wherever possible this responsibility should be carried out by the local authority. It is likely that further meetings will be necessary before the concert, to review safety procedures and the progress made in eliminating hazards and to consider new problems which may have arisen. Sub-groups should be set up to discuss specific matters, eg traffic management. Decisions reached at Event Planning Meetings should be confirmed in writing. Topics which should be covered include:-

(a) measures to minimise nuisance to local residents. Large outdoor concerts in particular can have a considerable impact on the local community and this must be fully considered. It may be necessary to undertake an Environment Impact Analysis in which such factors as noise, crowd management outside the venue, traffic arrangements, franchises etc are considered. The views of residents may need to be sought;

(b) the duration and timing of the concert (events would not normally be expected to start before 12.00 or finish after 23.00);

(c) procedures for summoning the emergency services;

(d) the promoter should provide the name of the artistes and the likely characteristics and age group of the associated audience;

(e) behaviour of the artistes which may affect the safety of the audience, for example, throwing items from the stage;

(f) any additional public transport facilities which are necessary to ensure that the audience is transported to and from the event;

(g) car/coach parking arrangements;

(h) access and egress for emergency vehicles;

(i) arrangements for crowd management, including barriers, fencing, means of escape, public address, sightlines, stewarding, policing;

(j) facilities for food and drink including catering for artistes and workers on site, licensed bars and franchises;

(k) arrangements for the storage and disposal of refuse;

(l) water supply and sanitary conveniences;

(m) first aid/medical facilities;

(n) emergency evacuation procedures, means of giving alarm and summoning of emergency services;

(o) any other events taking place on the same day that may have implications on police and transport resources;

(p) details and appraisal of special effects;

(q) use of appliances which involve the use of cylinders or pressurised containers of gas, eg LPG;

(r) facilities for disabled persons;

(s) competence and training level of workers.

Outdoor events - additional information

72. In the case of outdoor events, the following information should be sent to all relevant parties [see para 69 above] at least 28 days prior to the event.

(a) Plans (indicating scale)

   (i) Site layout - this should include the position of temporary structures, concessions/merchandising areas, first aid points, fire-fighting equipment, police control points, motoring organisation liaison and information point, coach/car parking, welfare facilities, sanitary accommodation/washing facilities, drinking water points, on-site transport facility, eg helipad, lost persons "reunite" position, refuse skips/crowd control barrier positions.

   (ii) Back stage - this should indicate the position of the crew, production team, catering, VIP entertainment area, artistes' changing accommodation etc, first aid facility, fire points, emergency services liaison point, security fences/gates.

   (iii) Site services - this should indicate drinking water points/ mains/tanks, soil and surface water drainage systems, electrical supply and generator points, water supplies, fire hydrants/valves and separate fire fighting water mains if applicable, perimeter and secondary fencing, cable ducts.

(b) Temporary Structures. Site, construction details, and loadings will be required of the following:-

   (i) Stage, moveable roof structure and PA wings.

   (ii) Sound mixing tower(s)/delay towers.

   (iii) Lighting tower(s).

(iv) Structures to support video or projection screens, TV cameras and crews.

(v) Disabled persons' viewing areas.

(vi) Front of stage and other safety barriers.

(vii) Viewing grandstands.

(viii) Film/sound/video/recording facilities.

(ix) Structures for special effects, eg balloon release.

(x) Tents and marquees.

(xi) Fire resistance or fire retardance of materials used.

(c) Electrical Requirements - physical dimensions, voltage, wattage and amperage of the following will be required:-

(i) Constraints on portable electric power generation equipment, eg fuel location.

(ii) Permanent artificial lighting facilities.

(iii) Temporary artificial lighting facilities.

(iv) Emergency lighting facilities (temporary or permanent) (including defects of backup power supplies).

(v) Special lighting, eg film/video/stage effects.

(vi) Site power - permanent/temporary.

(vii) Where alternating current electricity is to be used, it will be necessary to ensure that the supply frequency matches the needs of the load.

(d) Special Effects - location, use, plans, certificates if necessary will be required of:-

   (i) Stage lighting.

   (ii) Lasers.

   (iii) Strobe lighting.

   (iv) Pyrotechnics.

   (v) Dry ice.

   (vi) Confetti cannons.

   (vii) Smoke machines.

   (viii) Balloon fall storage.

   (ix) Very low frequency PA equipment (100 Hertz or less).

73. Contingency arrangements for inclement weather should be discussed at Event Planning Meetings. These could include such factors as the use of temporary metal roadways, use of sand or tree bark roadways, distribution of plastic bin liners to act as mackintoshes for the audience, vehicle tow-trucks in car parking areas and additional checks on temporary structures in the event of high wind speed;

Last minute changes

74. It is not uncommon for last minute changes to be made to the stage or auditorium layout, rigs etc at the request of the artistes or their management.

75. The implications of such changes on safety should be carefully assessed before being made. Examples of problems which may arise from this include the reduction of exit widths, reduction of available viewing area and the creation of narrow funnels on the site which might cause crushing in highly crowded situations. The use of temporary fences to protect particular areas needs to be carefully considered especially when they may need to be moved after the

audience have been admitted. At this stage, members of the audience may be close to the fence and moving it may cause serious management problems particularly if fork-lift trucks have to be used.

Pre-event inspections

76. Whilst it is the employers' responsibility to ensure health and safety and compliance with licensing conditions, the local authority may wish to inspect in the days leading up to the event. Temporary installations and structures may not be erected according to the plans and may not be in the right location. Inspectors may wish to be present when major structures, such as the perimeter fence, the stage, the stage barrier, the mixer tower and delay towers, are set up to ensure that standards are complied with. These structures are difficult or impossible to move once in place and problems need to be identified at an early stage if they are to be rectified before the event.

77. Site inspections are an effective means of assessing the standards that are being attained, and checking that the working practices are being undertaken in accordance with the safe practices/procedures that have been set up. The checklist at Appendix 3 will assist in carrying out inspections.

TRAFFIC AND TRANSPORT ARRANGEMENTS

78. A pop concert can have a significant effect on road traffic and public transport before, during, and after the event. If the transport arrangements are not planned, the consequences can range from delays to the audience and inconvenience for local residents to the substantial disruption of the local transport system and the prevention of access for the emergency services to the concert site and other areas.

79. A full assessment of the likely impact of the concert is needed so that suitable arrangements can be set up to manage the arrival and dispersal of the audience and to ensure that car and coach parking facilities are adequate. The police should be consulted about the proposed arrangements.

80. The use of a transport consultancy may be helpful to advise on routes, the opportunities for using shuttle arrangements between the site and remote car parks or railway stations, etc. The motoring organisations may be able to provide this consultancy service.

Traffic marshalling and signposting

(a) satisfactory arrangements for marshalling traffic and controlling access and egress from official car parks should be arranged in consultation with the police;

(b) marshalls should be employed to manage and direct parking and traffic flows to and inside parks;

(c) a satisfactory communication network should be set up between the marshalls and the police;

(d) for large concerts signposting is essential. This should be set up in conjunction with recognised motoring organisations and the police;

(e) routes to the site should be checked thoroughly prior to and on the day(s) of the event in order to ensure that all signs are in place. Spare signs should be available to replace any that are missing or damaged;

(f) temporary road closures may assist with traffic flows. The police and highway authority should be consulted about these as soon as possible in order that adequate notice of these closures can be given.

(g) there should be liaison with the local media to give notice of the concert, temporary road closures, etc. Wherever possible on the day there should be liaison with local radio to warn of traffic problems and ways of avoiding these problems if they exist.

Emergency Access

81. Emergency vehicles must have adequate access to and from the site at all times. This must be kept clear of persons and obstructions.

82. A procedure should be drawn up to co-ordinate police, fire and ambulance services in the event of a major emergency. Closed roads may be identified as potential rendezvous points.

Pedestrian Access

83. Adequate and convenient access routes to and from the site should be provided for the public. These should be well lit by either permanent or temporary lighting facilities.

84. Wherever possible pedestrian routes should be kept away from roads. They should not cross vehicular traffic routes if this can be avoided. When it cannot, supervision may be needed.

85. For outdoor concerts, pedestrian routes should be away from residential areas, where possible, and should be well signposted.

Public Transport

86. The availability of adequate public transport and the estimated arrival and departure times of the audience should be discussed with the appropriate transport authorities and the police well in advance of the date of the

concert. The licensing authority will need to take account of the availability of suitable transport in considering an application for a licence, both for indoor concerts and those held outdoors.

87. Special consideration should be given to the transport arrangements for concerts where the audience is likely to consist mainly of young persons, ie below 16 years old, because of their vulnerability.

88. For large outdoor and major indoor events, the use of existing or specially laid on public transport systems should be encouraged. Details of the transport arrangements should be advertised and these might include:

(i) Railways

A number of rail networks may be available for use, eg intercity/suburban services/underground/light railway systems. Maximising their use will limit the demand for on-site car parking and there should be early liaison between the organiser and the planning staff of the railway.

In addition to scheduled services, charter trains can be added for concert goers. This option should be considered in the light of the distance of the station from the venue and the availability of connecting bus and coach services.

Rail authorities should be able to advise on the maximum numbers that can be handled by a station. When large numbers will be attending, it may be necessary to have crowd safety barriers and a transport police presence to ensure that order is maintained at the station.

(ii) Coaches

At many sites, car parking space is limited and measures which reduce the need for the use of cars may be helpful. The organiser may wish to consider liaising with coach companies to offer a 'package' which includes the cost of travel and admission ticket.

The organiser may need to make temporary arrangements for those concert-goers who miss their coach on the return journey. To reduce the need for this, clear information should be given to passengers as to where and when coaches will be leaving.

(iii) Buses

Buses can be run either between a transport terminus and the venue or as part of a 'park and ride' system from remote car parks. Single deck buses may be more suitable than coaches as entry to and exit from these vehicles can be easier and faster. Boarding points should be properly designed and adequately lit.

It may be helpful if arrangements can be made with coach and bus operators for the temporary diversion of coaches and buses from the normal routes in order to connect with a shuttle bus service.

Scheduled bus services may run past the event, in which case special arrangements may not be needed, although a more frequent service may be advisable around the start and finish times of the concert.

(iv) Taxis

Wherever possible the organiser should arrange a "fixed price" taxi fare for the journey between a designated transport terminus and the venue for taxis. This should apply irrespective of the number of passengers or the time taken for the journey.

(v) Special Arrangements

Premises which are not served by rail or underground service or by an adequate bus service may need special arrangements. If this is the case, the organisers should provide alternative means of transport.

Parking

89. Procedures for parking cars, coaches and other vehicles should avoid tail backs of traffic or severe traffic congestion and disruption. Free parking arrangements may be of assistance in meeting this objective.

90. Concerts often finish after dark. All parking areas must therefore have either permanent or temporary artificial lighting positioned in such a manner that it gives an adequate level of illumination to the area to assist people finding their vehicles. Signs indicating car or coach park number or colour should be easily identified with reflective numerals or letters.

91. It is recommended that reminder signs should be positioned at exit gates leading from the parking areas to the venue, to assist those attending to identify where they have parked. This is particularly important in green field site car or coach parks.

92. If soft ground conditions are expected, a suitable number of tow trucks should be made available.

Outdoor events - special requirements

93. For large outdoor events, the organiser will need to ensure that provision is made for:-

- a system of entrance gate numbers, car park identification numbers or colours;
- emergency vehicle rendezvous points;
- motoring organisation points;
- telephones;
- pick up and set down points for taxis and private cars;
- shuttle bus boarding/disembarkation points.

94. The organiser may also need to consider if a helipad should be provided to assist access for the emergency services and special guests.

95. As far as possible, details of these arrangements should be publicised in advance. It is also helpful if details of primary and secondary routes to the venue, as agreed with the police authority, are made available as widely as possible.

Motoring organisations

96. It is inevitable that a number of problems will be experienced with starting vehicles. It is therefore advisable that the motoring organisations and recovery specialists should be invited to maintain a presence at or near the concert venue in order that a quick and effective response is available to hand. This will prevent them having problems reaching the site to deal with recoveries.

CROWD MANAGEMENT

Introduction

97. The management of an audience is an essential feature of the safe system of work. It can avoid crushing injuries and help ensure the physical comfort of the audience during the concert. Crowd management in an emergency is a critical factor in the safe, speedy evacuation. This section identifies the problem areas and suggests ways of tackling them through the use of physical and organisational means.

Entry and exit points

98. Entry and exit points provide the means by which the audience can be supervised, marshalled and directed to an event. They also need to provide immediate access for the emergency services and escape routes in case of an emergency during the concert.

99. To function effectively there needs to be an adequate number of entry and exit points - how many will depend mainly on the capacity of the venue and numbers expected to attend. Advance ticket sales will be a major indication of the latter. Entry and exit points must be kept clear of permanent and temporary obstructions, be clearly signposted and operate efficiently. Provision will need to be made for the admission of wheelchairs.

100. Good liaison with the police, public transport and emergency services will help ensure the smooth arrival and speedy departure of those attending the event with minimum disruption to the local area and the maintenance of necessary emergency services access.

101. In assessing possible risks at each event the following need to be considered:-

(i) access points and their management will need to be designed to ensure that crowds entering the venue are directed in a smooth manner and to avoid crowd build-ups, which could cause crushing;

(ii) exit arrangements will need to meet the calculated exit capacity;

(iii) the area immediately in front of the stage is a potential source of overcrowding, although it can be a very limited means of escape in particular circumstances where stewards lift members of the audience over a barrier.

Entry Points

102. The principal problems at the entry to an event are brought about by large numbers of people seeking to gain admission at the same time. This can result in crushing injuries and to severe physical pressure on gates, fences and turnstiles.

103. To reduce these risks the following are recommended:-

(i) entry points should be kept clear of all other activities likely to impede the smooth flow of the audience. For example, ticket pick up points should be located away from turnstiles, gates or direct routes to the entry points. Similarly, hawkers and concessionaires' stands should not be allowed to obstruct entrances. Stewards and barriers may be needed to alleviate any problems caused by queues of people waiting to enter the venue and possibly blocking entrances as well as emergency exits;

(ii) where possible, adequate queuing areas away from entrances should be set up;

(iii) barriers, fences, gates and turnstiles should be suitable and sufficient for foreseeable loadings imposed by crowds;

(iv) the type of entry will be determined by the venue. Where possible, and particularly at large events, a system of free flow should be adopted. This will speed up entry to the venue (see suggested arrangements below);

(v) where sports stadia are used for these events the turnstiles will already be subject to detailed inspection under the Safety of Sports Grounds Act 1975 and promoters should note that in the Final Report into the Hillsborough Disaster by Lord Justice Taylor he recommended that a maximum notional rate through any turnstile should be 660 persons per hour;

(vi) sufficient competent stewards should be provided;

(vii) admission can be staggered by providing a range of supporting activities and gates can be opened in advance of the published time;

(viii) a system can be established to count the audience as they enter the site or building, so that an assessment can be quickly made to ensure that the capacity specified in the licensing conditions is not exceeded. In many cases, this will be satisfied through ticketing arrangements.

Free flow arrangements - a suggested layout

DIAGRAM

PUBLIC ENTER BY ALL FOUR LANES. AT POINT 'A' THEY ARE CHECKED FOR A VALID TICKET.

AT POINT 'B' STEWARDS POSITIONED INSIDE THE DIAMOND TO CHECK FOR PROHIBITED ITEMS. ANYTHING TAKEN BY THE STEWARDS IS PLACED INSIDE THE DIAMOND AREA ALLOWING A CLEAR PATH THROUGH.

AT POINT 'C' THE TICKET IS CHECKED.

CLEAN UP CREWS CLEAR THE DIAMONDS BY CLOSING ONE LANE AT A TIME WORKING ACROSS THE LANES.

THIS SYSTEM CAN OPERATE ON ANY AMOUNT OF LANES.

104. In addition, it is suggested that all barriers should be removed from gates when crowd flow eases and entry gates converted to emergency exits as quickly as possible. Clean up teams should be employed to clear any build up of bottles and litter at entrance points to prevent fire or tripping hazards.

Exits

105. During the event members of the audience may wish to leave on a temporary basis and to re-enter. A system for "pass outs" may be necessary and this needs to be carefully controlled to ensure that it is not used to get items prohibited* by the licence or by the organiser onto the site.

In the case of outdoor events, stewards need to monitor the perimeter to ensure that people with "pass outs" do not, in conjunction with friends still inside the event, use it as an opportunity to get prohibited items into the event.

106. At the end of the event the audience should leave the area as quickly as possible. They may also be asked to leave in the event of a general emergency. Both circumstances can result in pushing, causing falls, and crushing if insufficient or inadequate exits are provided. (Guidance on exits and evacuation times is set out in paragraphs 216-219).

107. It should be noted that members of the audience will tend to leave the event by the same way that they entered. To ensure a speedy exit, suitable and sufficient signposting should be provided. It should be clear, concise and

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* Prohibited items may include drugs, glass bottles, metal containers, flammable materials, alcohol (especially spirits).

conspicuous and where possible graphics should be used in preference to text. These signs should indicate all exits to be used as a means of escape and should be lit, in the absence of natural light. In the case of outdoor events, exit signs will need to be illuminated when the light is poor.

108. Wherever possible exit doors should be positioned open and received in place in a direction away from the expected flow of people. Exits should wherever possible be designed to open out. There should be no obstructions or constraints to impede the flow of people.

Design of notices

109. It is a statutory requirement, under the Safety Signs Regulations 1980, that a safety sign which gives health and safety information or instruction should comply with Part 1 of BS 5378. Signs at outdoor events must be large enough so that they can be read.

110. Exit and directional signs are covered in the section on fire prevention and fire-fighting (paragraphs 498-505).

Site management: Outdoor events

111. Site arrangements will vary from venue to venue. These will range from a green field site to a purpose built auditorium.

112. The hazards involved and the consequent risks will vary as will the necessary preventive measures which will need to be considered. This section addresses a range of foreseeable hazards. It will be for the employer to ensure that within his safe system of work the necessary mechanisms exist to identify hazards and assess risks in the particular circumstances existing at the site.

Audience Size

113. An essential feature of site management is to establish the maximum number the site will hold and then take all necessary steps to ensure that this figure is not exceeded. It will be necessary to take into account all ticket holders, passholders, employees, guests, etc.

Admission of Young Children

114. At certain events, attendance of young children, particularly those under the age of 5, will not be appropriate. Organisers of events should give careful consideration to this and should assess the need for measures to prohibit the attendance of children. Prams and pushchairs should not be allowed into the venue unless the hazards they can create are carefully evaluated and the necessary arrangements made to deal with them.

115. The maximum capacity of the site must be established in order:

(a) to facilitate management of the crowd and to help in the elmination of crowd densities which could result in crushing injuries;

(b) to identify other facilities needed, eg sanitary conveniences, first aid, stewards, fire-fighting equipment, etc;

(c) to allow safe access and egress;

(d) to allow safe egress of the audience from the site in an emergency.

116. It is recommended that the calculation of site capacity be based on the following guidelines, ie:

(1) the number of seats where seating accommodation is provided;

(2) one person for each 450 mm (1 ft 6 in) length of seating where bench seating is provided;

(3) one person per 0.5 m2 (5sq ft) on stepped terraces; or

(4) one person per 0.75 m2 (8 sq ft) on sloping terraces and level areas whether indoor or outdoor.

Where appropriate, allowance will need to be made for areas taken up by mixer, delay towers, merchandising and catering units as the audience cannot use these areas. Areas where there is no sightline of the stage should also be deducted.

Notwithstanding this calculation, the capacity should never exceed the limit calculated for means of escape purposes.

117. In certain circumstances and particularly for short-duration events, and for longer events in the areas immediately in front of the stage, crowd densities may be allowed in excess of these figures. For example, it may be reasonable to permit a notional density of up to 0.3 sq m/person.

118. Other legislation and technical standards may apply, eg a certificated sports ground under the Safety of Sports Ground Act 1975. In such circumstances, there will be a need to take into account the different activities and lengths of time for which the standards were intended to apply. It would be inappropriate for instance to permit the approved density for a 2 hour football match, at an 8 hour pop concert.

119. The licence issued by the local authority will stipulate maximum numbers. In no circumstances should this number be exceeded. For this reason admission should normally be by ticket only. If tickets are for sale at the event, their number should be limited to that which, together with the tickets sold in advance, does not exceed the permitted number.

120. At premises where a physical check on the number of persons admitted would be impracticable, an account showing the number of tickets printed, unsold tickets and ticket stubs should be available for examination.

121. To prevent overcrowding at an outdoor site, by eliminating the possibility of trespassers entering the site, there should be a substantial perimeter fence [10-11] feet in height and able to withstand a crowd loading of 2kN/m at a height of 1.2m.

Seating arrangements

122. Generally, seating should not be provided immediately in front of an area where there is a standing audience. This can cause management problems with the standing audience if, for example, their line of sight to the stage becomes obscured and may mean that a secondary barrier, with stewards, has to be provided.

123. Where the audience is likely to be predominantly under the age of 16, concerts should be all seated because of the difficulties that may arise with hysteria and the height of the front of stage barrier which will be designed principally with an adult audience in mind. Stewards will need to ensure that young audiences are kept in their allotted seating places. Audiences should not be allowed to stand on their seats or migrate into aisles and gangways but they may stand in the wells in front of the seats.

124. Audiences in front row balcony seats should remain seated unless leaving their seats. This will avoid blocking the lines of sight of those seated behind them and more importantly will avoid falls into the levels below.

125. When seating is used at outdoor events it will be necessary to ensure that the stands are well-screwed to the ground by deep anchors and that the seats cannot be torn from their mounts and used as missiles.

126. In adverse weather conditions experience has shown that audiences are reluctant to remain seated and will migrate. This can create management problems and lead to overcrowding in unpredictable areas. Arrangements may need to be made to deal with this.

Stairways and ramps

127. Movement on stairways, especially downwards poses a considerable potential risk to individuals at the end of an event, or in an emergency because of the pressure from behind. The commonest form of accident - slips, trips and falls, frequently occurs on stairs and is more likely to happen in congested circumstances. To avoid this, stairways should have a uniform width going and rising, secure footing, and shallow gradient. The width should be sufficient to allow free movement but narrow enough to allow access to a handrail. The head of the stairway should be so designed that flow onto it is

uniform across its width and crowd pressures cannot easily be generated. Flights of stairs should not provide long, uncontrolled paths down which crowd pressures and surges can develop. Adequate separation should be provided between channels and multi-channel stairway arrangements so that there is no overspill from one channel to another.

128. Where possible, stairways should be carefully positioned to take advantage of natural light and ventilation. Where the natural lighting is inadequate the stairway should be adequately lit by artificial light.

129. The following criteria (to paragraph 138) are contained in the Home Office/Scottish Office publication 'Guide to Safety at Sports Grounds', often referred to as 'the Green Guide'. If a pop concert is held in a certificated sports stadium, it will be necessary to consider the different nature of the event, particularly the presence of a part of the audience on the pitch.

- the width, rise and going of the steps should be uniform within each stairway, and should ideally be uniform throughout the entire system;

- on any stairway the preferred going of treads should be 305 mm but not less than 280 mm; and preferred height of risers should be 150 mm but not more than 190 mm;

- stairways should be in flights of not more than 16 steps;

- stairways should make at least one change in direction between flights of at least 30° if there are more than 36 risers in consecutive flights;

- the going of the landing between flights should not be less than the width of the channel of the flight;

- guarding should be provided on both sides of all stairs and landings. Where next to open wells, or spaces, such guarding should be enclosed, in accordance with Building Regulation requirements, and should not be less than 1.1 metres in height (measured vertically from the centre of the step, or the surface of the landing). The guarding should have a strength equivalent to 3.4 kN/metre width design force, 4.1 kN/metre width test load;

- stair treads should be provided with slip-resistant surfaces and durable edging. Adequate drainage should be provided;

- open risers should not be used;

- stairways should be without winders.

130. The minimum width of a stairway or stairway channel should be 1.1 metres. The maximum width of a stairway channel should be 1.65 metres. Consideration will have to be given to dividing existing stairways wider than 1.65 metres but which do not exceed 2.2 metres taking account of the extent to which they comply with other stairway requirements. Stairways of 2.2 metres or more should be divided into channels having a width of not less than 1.1. metres and not more than 1.65 metres.

131. Handrails should project not more than 100 mm and should be provided on both sides of all stairways, steps and landings at a height of not less than 840 mm (measured vertically from the centre of the step or the surface of the landing). All handrails should extend by at least 300 mm beyond the top and bottom of any stairway or ramp.

132. The strength of the handrails (including supports) used to divide a stairway into channels should not be less than 3.4 kN/metre width design force or 4.1 kN/metre width test load for handrails at right angles to the direction of the crowd flow; 2.2 kN/metre width design force or 2.7 kN/metre width test load for handrails parallel to the direction of the flow.

133. Access to the head of the stairways should be controlled to ensure a free flow of spectators.

134. Where a stairway is divided into channels the access should be designed to secure a uniform flow down each channel.

135. The approach to the head of the stairs should be level and should be so arranged that the spectators converge on the stairway from the front and/or the sides only. There should be no approach from behind, involving movement around the ends of the balustrades or side walls of the stairway, except where this approach is already controlled by physical means such as by the gangways in the seated areas of the stand.

Figure

ILLUSTRATION

Notes

No centre rail considered desirable because stairway width is under 1.65 metres.

Handrails at each side should project at least 300 mm beyond the top and bottom risers of the stairway..

Flow rate calculation reflects actual width:-

$\frac{1.525}{.55}$ m x 40 = 111 per minute

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136. The approach in the direction of the stairway should not be less than 1.1 metres and preferably not more than 3 metres unless access is totally controlled.

137. Where restrictive elements such as barriers or gateways are installed in the approach from a terrace to a stairway, in order to meet the foregoing provisions, the total width of the passage formed by these elements should not be more than two-thirds the minimum width of the stairway. This is to accommodate the slower flow rate down a stairway as compared with the flow rate on flat areas and through portals.

138. All exit stairways should discharge either:

(i) at ground level and lead directly to a place of safety* in the open air; or,

(ii) on to walkways or concourses of adequate dimensions at any level provided these lead directly to a place of safety in the open air.

Ramps

139. Where ramps are used or built they should conform to the following standards wherever possible:-

- the gradient should be constant and not broken by steps;
- the maximum gradient acceptable will depend on the particular ramp's length, purpose and usage. A ramp subject to heavy crowd flow should not exceed a gradient of 1 in 10;
- ramps installed for wheelchair users should conform to BS 5810.

140. For other slopes etc: the following should be borne in mind:-

- the 'Green Guide' recommends that viewing slopes with a gradient in excess of 1 in 6 should not be used without further structural safety provisions. For pop concert sites, a slightly more acute gradient may be possible. In such circumstances, it is likely that slopes will need exit steps, which should have a non-slip surface;
- the area in front of the stage should be a flat even surface.

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* In Scotland 'place of safety' is a defined term in the Scottish Building Regulations.

Viewing Area

141. The general principle should be to achieve the widest possible sightline in an area from stage right to stage left. This reduces the tendency of the audience to crush to the front to obtain a better view. Good sightlines are critical in reducing front of stage crowd density and avoiding surges and consequential crushing injuries.

142. Stages should be positioned so that the area immediately in front is level and even. Surfaces should not be slippery. Stage heights and screamer* heights should be positioned to provide good sightlines, particularly from the front of the stage barrier. Performers stage position should be downstage where sidestages or drapes obscure side views. Consideration should be given to setting back sidestages where performers must be located upstage for production reasons.

Video screens

143. At large concerts, the use of video or projection screens (eg starscreens) may be appropriate.

144. Screens are normally situated adjacent to the stage and used to relay pictures of the onstage area. This reduces the tendency of those situated away from the front of the stage area to press towards the front. At outdoor events, screens can also be located some distance from the stage, with the aim of attracting a proportion of the audience to a particular area of the site. In these circumstances, it may be advantageous to use screen(s) which operate in daylight.

145. Video screens can be used to provide information to the audience about safety, facilities and transport, etc. Urgent messages can be displayed, although in an emergency other means of communication will also need to be used as screens may not be visible in all areas of the site. The use of screens to provide entertainment before the concert and during changeover periods can also be a useful means of preventing crowd disturbance.

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* A screamer is an elevated platform which runs from the centre of the stage to the extremity of stage right or left.

Crowd Management on opening entrances

146. At concerts with standing areas, to avoid crushing, the audience should not be allowed to enter directly into the front of the stage area from stage right or left. Stewarding, barriers and manipulation of sidestage sightlines can ensure that this does not happen. Care should be taken however not to compress the crowd shape into a wedge because this may create discomfort, although it may not be dangerous.

ILLUSTRATION

147. Line(s) of stewards across the arena to prevent the audience running towards the stage, supplemented by public address announcements, can help ease crowding and prevent slipping, tripping and falling accidents.

148. Once the audience arrive in the front of stage area, they should be encouraged to stand or sit as close as possible to the stage safety barrier. Artificial spaces in front of the stage should not be created, for example stewards should not be used to keep an area clear in front of the barrier when it is known they will subsequently be moved.

Thrown objects

149. To avoid head injuries measures should be taken at entry points and at sales points to ensure that metal cans, glass bottles or other missile material are not admitted to the concert. In order to keep entrances clear and unobstructed, refuse containers should be provided so that any confiscated material can be disposed of outside the venue.

Barriers

150. Barriers at pop concerts can serve different purposes. They can provide physical security, as in the case of a high perimeter fence at an outdoor concert, or be used to prevent the audience climbing on top of mixing towers, etc. They may be used to relieve crowd pressures. They may also be used to provide the audience with additional help or support -for example when front of stage barriers are used, those suffering physical distress can be reached more easily by competent and trained personnel from the front of stage barrier rather than from the back of the venue.

151. Irrespective of the primary purpose the barrier is designed to achieve, it will experience crowd loading. It should be designed therefore to withstand right angle and parallel loads.

Front of Stage Barrier

General

152. The employer must assess the need for a front of stage barrier. Factors such as crowd densities, behaviour and size of audience, venue will need to be evaluated. Generally, for most open air and indoor concerts some form of front of stage barrier is needed. However, this is not invariably the case and only a careful assessment will show whether one is needed or not. The local authority may well require the use of a front of stage barrier as a licensing condition.

153. Crowd densities in front of the stage barrier may be high because of the view the position provides of performers on stage. If the crowd surges, dynamic loads on those at the front of the stage barrier may be considerable. Experience at sports stadia and scientific evidence suggests that, although unpleasant such loads are unlikely to cause injury. Similarly, static loads do not appear to play a significant part in causing injury at pop concerts. The vast majority of First Aid cases reported are faintings and exhaustion due in part to other factors (heat, alcohol, hysteria, etc). However, anyone falling to the ground whilst in the crowd may be trampled and this can cause serious injury or even death.

The "Pit"

154. The "pit", the area between the stage and the front of stage barrier, needs to be designed to facilitate the work of stewards, and possibly first aiders and para medic staff. Stewards will need to extract members of the audience who are in distress. The barrier on the audience side must be at the right height for the audience in order to prevent thoracic compression. The pit itself must have a non-slip unobstructed working area big enough to allow those in the pit to lift members of the audience onto it. The way in and way out of the pit should be unobstructed to allow stretcher bearers clear access to a first aid point away from the pit area. TV film and photographers should not be allowed to work in the pit area unless they are physically removed from the stewards working area.

ILLUSTRATION

Types of Barrier Construction

155. There are 3 types of barrier currently in use in the entertainments industry (see illustration above):-

(i) an 'A' frame scaffold barrier (tube and couplers). This normally has a 1 m tread plate at the front. In some cases the barrier is tied to the stage to prevent lateral movement;

(ii) a demountable barrier system. These are custom built for the purpose and easily transported. They are also A framed and rely on a tread plate at the front to maintain their stability. They are normally free standing but if used outdoors should be fixed to the stage structure with couplers;

(iii) a barrier constructed from staging sections with additional bracing to meet the loading requirements. These may be box section steel structures.

156. Barriers should be covered with suitable materials to prevent cuts, trapping injuries and abrasions:-

(i) metal barriers must be smooth with no rough edges or trapping points. The top of the front plate or board should be padded to prevent injury. There should be no sharp or protruding objects ie bolts;

(ii) scaffold barriers should have all exposed couplers padded which might cause injury. Where plywood is used as a front board, it should be 19 mm ($^3/_4$"). Where a satisfactory shape cannot be obtained in order to fit a board into a curved design and the thickness is reduced, then the board should be impregnated to a standard of B.S.476 Class 1 fire resistance.

Barrier Loadings

157. Tests have shown that women are less able to withstand crushing pressures than men. This is a factor which should be considered at a concert which is likely to attract a predominantly young female audience.

158. It is recommended that any front of stage barrier should comply with a minimum loading standard of 5kN/m right angle load at a height of 1.2m. The loading factors on the barrier are set at a standard to avoid structural collapse and not at a pressure limit which can be tolerated by the human body.

159. BS 6180 Code of Practice for protective barriers in and about buildings contains detailed guidance about the general design and construction of temporary and permanent protective barriers around buildings and places of assembly. Margins of safety will need to take account of a number of factors including the site, the size and nature of the audience, artificial breaks created within the audience, etc. A competent person needs to assess the requirements for each event.

Shape of the Barrier Front of Stage

160. With standing audiences, wide convex barriers extending into the audience have been shown to provide considerable additional safety benefits over straight barriers. The curve should be across the main performance area, terminating close to the ends of the sidestages. Concave stage barriers should never be permitted as they form dangerous trapping areas. At certain venues, eg indoors where there is restricted space, straight barriers are satisfactory. However, curved barriers have the following advantages:

(a) they dissipate crowd surges away from the centre of the stage. When used in conjunction with escape routes to the right and left of the stage and, especially with designed sightlines, they provide improved escape provisions;

(b) because they have a greater length, they provide a wider front row sightline;

(c) they improve security by placing a greater distance between the downstage edge and the barrier making it difficult for enthusiastic fans to "jump the stage";

(d) they provide a wider area for rescue and first aid to operate within a "pit", should it be necessary.

ILLUSTRATION

Barrier around thrusts

161. Where thrusts * extend into the audience either a stewarded 1.2 m high barrier complying with the design criteria and loading factors for a front of stage barrier or a scaffold structure close boarded to a height of 2.4m and

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* A thrust is a section of the stage which projects from the main body of the stage towards the audience.

designed to comply with the required crowd loading standard. Care should be taken to ensure that such stage designs do not create concave trapping points from which crowds cannot escape. This may be avoided by provision of short exit tunnels beneath such thrusts. Any curved barrier should therefore terminate at these tunnels as they form pressure reliefs as well as exits.

Sidestage barrier or fences

162. At a certain point, the 1.2 m stage barrier will need to rise to 2.4m to form a sightline obstruction at the end of the side stages. The design of this feature will regulate the shape of the crowd either to a wide fan or a narrow wedge. There can, on occasion, be a conflict between stage security, who may wish to have a narrow crowd wedge to make management of the front of stage crowd easier, with limited numbers of stewards, and the safety need for a wide fan which is likely to create a lower crowd density and is therefore preferable. On wide outdoor concert stages, the point at which the fence rises is usually 6m into the side stages. This high barrier will ensure that important exits stage right and stage left are kept clear and ready for use in an emergency and should be provided for standing audiences.

ILLUSTRATION

Other Barriers

Pens on flat open arenas or sites for standing audiences

163. Penning of audiences in flat, open areas is generally unsafe and its use is not recommended. It is difficult to meet the necessary structural loading requirements, without major works to achieve footings. Alternatively, it requires large quantities of demountable barriers suitable for the crowd loadings which will be needed. Planning adequate means of escape may also be difficult. Penning on flat open arenas or sites may only be suitable with a multiple barrier installation.

Multiple barrier arrangements

164. In some instances, it may be possible to introduce double or triple barrier arrangements radiating out from the front of the stage. These arrangements form pens in front of the stage. The barriers should form a convex curve into the audience with escapes from both ends. Because of the amount of barrier required it is only practical to use a demountable system.

165. In such cases, adequate arrangements must be made to enable prompt evacuation within a specified time limit. Calculation must also be made regarding the overall impact of these arrangements on means of escape from the arena or site and should take account of aggregated crowd loads. Double or triple systems can reduce the incidence of crowd surges and subsequent crushing to a minimum, provided that a comfortable capacity calculation is made and the systems managed properly. By creating an empty corridor or pit at each barrier point, steward access to the crowd can be improved dramatically. Each curved barrier therefore should be provided with a corridor behind it, to enable stewards and first aiders to have adequate access to the public along the length of the barriers. The barriers used to achieve this should also meet the required minimum loading of 5 kN/m run.

ILLUSTRATION

166. Areas must also be maintained at the ends of the barriers to prevent congestion and to provide a guaranteed means of escape. Escape routes can be maintained with the use of gates at the edges of the furthest barrier from the stage. Adequate sightline management can prevent the creation of trapping points at access gates. In designing these structures, great care needs to be taken to create adequate means of escape. All gates must open in the direction of exit and no gate should impede the path of another exit route.

ILLUSTRATION

167. Multiple barrier systems require strict control of capacity. One management system that has proved effective in controlling access is the use of colour coded wrist bands (one colour for each pen), with a fixed number issued to security personnel, corresponding to the capacity of the pens. If the wrist band is removed to pass to other pens, then the fastening is destroyed and entry to the pen is refused.

168. It should be stressed that with enthusiastic audiences, it is likely that many of the problems normally encountered at the front of stage barrier will be experienced at the barrier furthest from the stage. First aid and stewarding arrangements need to reflect this. However, because of the wider sightline potential (75% in some cases) and the increased distances from the stage, the incidence of crowd surge and crushing is vastly reduced.

169. Multiple barrier systems may not be suitable for all sites or buildings. They are considered to be more suitable for pop concerts in sports stadia because of the pitch perimeter fencing which gives controlled side escapes. These structures are difficult and expensive to create on open sites. If means of escape are not considered with great care, multiple barriers can become a dangerous system of pens. Where installed at a suitable venue, with proper means of escape, they can make the event more comfortable and safer.

Licensing Considerations

170. Where it is foreseeable that standing audiences are expected to produce crowd loading then a barrier might always be required as a condition of licence. Where a seated audience at an indoor concert is unlikely to move into gangways, etc, there may be some scope for relaxation. This will depend upon knowledge of the performer and their audience. At large venues, indoor and outdoor barriers should be set at a minimum distance of 3m from the downstage edge and reduced to 2.5m for closely seated audiences. The downstage edge

should be taken as the last edge of the structure and not the edge of the performance area, ie. camera platforms etc may protrude a number of metres beyond the latter. (Note: This does not apply to thrusts).

171. Similarly where multiple barrier systems are considered appropriate the capacity for the pens therefore should be set as a condition of licence and LA Inspectors should ensure that management systems exist to control the holding capacity.

Stewarding

172. Effective stewarding should assist crowd management, prevent overcrowding, reduce crushing problems, minimise injury and provide emergency back up.

173. It is the employers responsibility to manage the audience. If police are present their role is to deal with public order and any criminal behaviour. This difference in roles needs to be clearly understood.

174. All concerts should be preceded by a survey which should identify the hazards, assess the risks, and identify the areas where stewards will be needed. This survey will provide the information needed to determine the number of stewards required to manage the audience and the event (eg car parking, crowd control, etc).

Numbers and types of stewards

175. All concerts require a suitable number of competent and trained stewards to manage the audience. The level of control and the consequential manning levels will vary considerably according to the venue, artiste and audience mix. As much information as possible should be obtained about the performers and their audience.

176. Stewards will also be required for different purposes for example staffing barriers, controlling entrances, marshalling traffic and vehicle parking.

177. The number of stewards and the competences which they need should be assessed. This assessment will depend on the tasks that need to be undertaken.

178. Generally a prescriptive approach is not possible, as the requirement will vary according to the nature of the event, the audience and the artistes. It will also depend for example on the length of barrier to be staffed, the number of entrance points where ticket controls are needed, the conditions of entry as regards admission of young children, alcohol and containers.

179. The assessment needs to reflect where stewards will be needed, the competencies which will be required for each kind of work station, and the reliefs which will be required.

Indoor Events

180. It is recommended that there should be:-

(a) a minimum of one steward for every 100 members of the audience or part thereof at a venue without seating;

(b) a minimum of one steward for every 250 members of the audience or part thereof where most of the audience is over the age of 16, at a venue where permanent fixed seating is provided;

(c) a minimum of one steward for every 50 members of the audience where most of the audience is under the age of 16, at a venue where permanent fixed seating is provided;

Stewards for car-parking or traffic marshalling should be additional to the number necessary for crowd management under the above calculations.

Outdoor Events

181. It is not possible to recommend criteria for the number of stewards needed at outdoor concerts because of the large range of venues that may be involved. Experience of previous events may be a guide to the number of stewards needed. The survey, referred to in paragraph 174 above, should be

used to inform the decision that will need to be made on the numbers, types and competences of stewards. Factors that may suggest a higher level of stewarding would include sites where:

- there is a large audience, particularly in a small area;
- the characteristics of the performers and audience suggest less disciplined behaviour;
- the concert is conducted at the front of a bowl or within an area where there are slopes around the arena;
- there are a limited number and means of access and egress;
- the concert is held within a small area with substantial high perimeter walls or fences.

Primary Duties

182. Stewards' primary duties are:-

(a) to ensure that no overcrowding occurs in any part of the premises by controlling and directing the audience when entering and leaving the premises/site and achieving an even flow of people and an acceptable density;

(b) to keep gangways and exits clear at all times;

(c) to prevent standing on seats and furniture;

(d) to investigate immediately any disturbance or incident (note: this is particularly important where crushing could occur and first aid could be needed quickly);

(e) to report immediately to a nominated person, using agreed procedures, any fire or other emergency and where appropriate take necessary action (eg put out small fires with extinguishers);

(f) to be familiar with safe evacuation procedures.

Organisation

183. Stewards should be organised as follows:-

(a) every event should have a named chief steward directly responsible to the promoter and who should have the overall management responsibility for all stewards. The chief steward should have access to non-classified local emergency plans to assist in directing people away from the site or to hospitals. The control of the stewards should be from a convenient control point with good communication links to other stewards;

(b) the site should be divided into areas identified on a plan. For outdoor premises this should be a grid map compatible with those used by the emergency services. Each area should be controlled by senior supervisors. Senior supervisors should have a maximum of three supervisors each of whom control a maximum of nine stewards. Personnel should be located at the identified key points and their position indicated on the plan;

(c) each supervisor should be in possession of the plan which should show the location of the following where appropriate:

    (a) Fire fighting equipment
    (b) Sanitary conveniences
    (c) Telephones
    (d) Information
    (e) First Aid
    (f) Disabled entrance
    (g) Disabled viewing
    (h) Drinking water
    (i) Festival Welfare
    (j) Position of events

Stewards should:-

(a) be competent to undertake the necessary duties;

(b) maintain a fire patrol;

(c) be readily identifiable, for example through the use of distinctive clothing. It should be possible to identify them individually by means of a name or number. Steward management, especially those with portable means of communication, should be easily distinguishable;

(d) be familiar with the location of the first aid points and the emergency evacuation procedure, including coded messages;

(e) not be stationed for long periods near to the loudspeakers;

(f) not leave their place of duty without permission. Arrangements should be made for stewards to be relieved at reasonable intervals;

(g) be located at key points where control is needed such as in the open arena, the gangways, the exits, the entrances and the barriers. All areas of potential hazard should be staffed ie pit, mixer, delay towers;

(h) be stationed at the top and bottom of gangways;

(i) staff all exits whilst the public are on the premises;

(j) not undertake other tasks such as selling ice creams/programmes etc;

(k) not consume alcohol whilst members of the public are on the premises;

(l) be briefed prior to the event;

184. The public, particularly at large events, should be advised who the steward personnel are. Such information should be clearly and conspicuously displayed at strategic points.

185. At least two observation points should be installed at major concerts. Observers should have a clear view of the audience and have radio communications. They should be provided with head sets or ear pieces to overcome general background noise.

Training of Stewards

186. All stewards should be competent and trained so that they can carry out their duties effectively. A record should be maintained of the stewards who have achieved the necessary competences and this should be available for inspection. The proper training of stewards is a vital element in ensuring that they have the necessary knowledge which will enable them to do their jobs properly and efficiently. It will also ensure, in particular, for those working in the pit, that they are able to lift distressed persons out of the audience safely and without risk to their own health and safety.

Fire control and emergency evacuation:

187. All stewards should be competent and trained in fire control and emergency evacuation. They should also be familiar with all emergency procedures and the site lay out. This should include:

(a) the action to be taken upon discovery of fire;

(b) the action to be taken upon hearing alarm;

(c) location and use of alarms;

(d) the correct method of calling the fire brigade;

(e) the location and use of fire fighting equipment;

(f) knowledge of escape routes including any stairway not in regular use;

(g) appreciation of the importance of fire doors and the need to close all doors at the time of the fire and on hearing the alarm;

(h) knowledge of method of operation of all escape doors and fastenings;

Disabled:

188. An adequate number of stewards should be competent and trained in the special needs of disabled people and be physically capable of rendering assistance to disabled people.

Special Training needs for supervisors

189. Supervisors should be competent and trained in fire control, emergency evacuation and cardiac pulmonary resuscitation (cpr). Senior supervisors should be trained in fire control, emergency evacuation, emergency first aid (including bleeding, unconsciousness and cpr). At small events, the requirements on cpr and first aid may not need to be applied providing adequate first aid arrangements are made.

Pit Staff

190. Stewards in pit teams should have received the necessary competences and training in extraction of persons from dense crowds. At least four of the pit team where there are more than 15,000 persons attending the event should be competent and trained paramedics.

Professional Security Advice

191. It is the responsibility of the promoter and licensee to ensure that an adequate level of stewarding is provided on site and to decide how the proposed security survey is carried out. There are however a number of specialist companies who undertake this task. If one of these is used it is recommended that the following questions need to be addressed:

Does it:

carry adequate public and employer liability insurance;

maintain accurate personnel files;

have a company policy on health and safety;

possess a company code of conduct;

employ personnel who are competent and trained in the following areas:

Fire control
Basic First Aid
Emergency evacuation
Bomb threat
Radio procedure.

What are the competences that these personnel have achieved?

Communication

Introduction

192. Communication on site, particularly during a major event is of paramount importance. Good, clear, concise communication must exist amongst and often between the various disciplines on site. Each organisation, eg police, stewards, fire authority, first aid, organisers, local authority will have its own chain of command and communications arrangements to relay information, start emergency procedures and to manage the site effectively. In an emergency the police and the event security organisation will need to ensure there is a good communications procedure and discipline.

193. Communication with the audience is also important. Research has shown that people subjected to overcrowded conditions and excess stimulation have difficulty with orientation. Therefore, there needs to be conspicuous signage and clear and frequent public address announcements. Video screens may also be helpful (see paragraphs 143–145 above).

194. Prior to the event, clear written procedures should be agreed. These should set out defined roles and specific duties and should be agreed with the local police.

195. At major events, separate facilities should be provided for the exclusive use of senior personnel from the police, fire authority, first aid, local authority and stewards; so that, if necessary, joint discussions etc can be held at easily identified locations (see paragraph 205 below).

Radio

196. Radio communication is increasingly being used and the following points should be addressed:

(a) all major events should have a properly organised radio operations centre adequately staffed by competent and trained radio operators. They should be relieved at regular intervals;

(b) all frequencies should be submitted to the organiser prior to the event and records kept in the radio operations centre;

(c) in order to establish an overall picture as an aid to management, "key" frequencies such as emergency services, stewards and organiser should be monitored and conversations logged;

(d) a check on the radio should be carried out immediately upon its receipt to ensure that it is working. Tests should be carried out not less than 100m from the base control unit;

(e) call signs should be used and should be unique to the individual;

(f) for portable radios, a fully-charged battery should be installed prior to the event and a fully-charged spare battery should be carried;

(g) a charging facility for batteries should be available on site;

(h) correct radio procedure should be followed using the well established technical vocabulary. Air time should be kept to a minimum;

(i) where reception is poor, repeaters should be used to inform the control of the need to contact them;

(j) where persons are stationed in 'noisy' areas, ear pieces should be used;

(k) in an emergency situation, coded messages should be used and radio silence maintained by non-essential users.

Public address system

197. There should be separate systems for the broadcast of the music and for public address in the event of an emergency. Both systems should be under the direct control of a competent person, so that broadcast emergency messages can override the performance. The power supply should ensure continuous operation in the event of a failure of the mains power system. British Standard 7443 specifies the requirements for sound systems used in the event of an emergency.

198. The public address system should allow messages to be heard clearly and audibly in all parts of the premises. The systems should be controlled from the central control point and should be accessible to the emergency services if necessary.

199. The electrical system to the public address system on the site should be duplicated with both normal and emergency systems.

200. Wiring of the system should be routed through areas of low fire risk and should be protected where necessary against mechanical damage and interference by unauthorised persons. Where a permanent system is to be provided the wiring should be installed in accordance with the appropriate sections of the current British Standard 5839 : Part 1 or equivalent.

201. Loud hailers should be available for use by stewards and police.

Compere or DJ

202. The use of a competent compere, DJ or other celebrity is recommended. They should be able to identify with the audience and should relay information to the audience in order to assist with its management. For example, if overcrowding is evident the compere could ask the audience to move back. This is more likely to achieve a positive response.

203. If performers are on stage, they may be able to fulfil this role (see also below on emergency procedures - paragraph 215).

Emergency procedures

Introduction

204. An emergency situation arises rarely. However, at large gatherings of people, the consequences of an emergency can be catastrophic and it is necessary to plan for the proper handling of any such occurrence. Some emergency situations will involve a multi-disciplinary approach: stewards, police, ambulance services and fire services may all play a part. Strict demarcation of duties and responsibilities should be agreed and understood.

Emergency Services Office

205. A designated emergency services office should be provided at all major events for the exclusive use of senior personnel from the police, fire authority, first aid organisations, local authority, steward and promoters. This forms a decision making area. A dedicated external telephone line should be provided with the office. A public address system, separate from the concert sound system, should also be provided (see paragraph 197 above).

206. Secondary emergency power and lighting services should be provided to the emergency services office.

207. A common gridded site plan indicating all services etc (see planning and management section) should be used by all and a copy should be displayed in the emergency services office.

208. The organiser is responsible for dealing with any other emergency situation which takes place on the site and for taking the decisions needed to deal safely with emergency situations. The police will generally offer advice on how to deal with emergencies. Their role in some incidents, such as stage collapse, air crash, etc, where it might be more appropriate for the senior police officer, who may be designated as 'Event Commander', to take charge, will need to be established.

Major Incidents

209. A major incident is an emergency that requires the implementation of special arrangements by one or all of the emergency services for:

(a) the rescue and transport of a large number of casualties;

(b) the involvement, either directly or indirectly, of large numbers of personnel;

(c) the handling of a large number of enquiries from both the public and the news media;

(d) dealing with an incident that requires the large-scale combined resources of the three emergency services - police, fire and ambulance.

210. All emergency services have an emergency procedures manual to deal with major incidents. However, a specific major incident plan will need to be drawn up for a large pop concert or festival. This plan should be drawn up following consultation between the emergency services and the organiser. The aim of the plan will be to allow the emergency services and the organiser to react quickly and efficiently to a major incident. The plan should be seen as a guide to the action required and should allow for flexibility in the response.

211. The police will normally be responsible for the control and co-ordination of the response to a major incident. This overall control will assist in the effective operation of all the emergency services and will prevent confusion and possible competing interests. The police will therefore need to establish contact and liaison with all other key agencies at the earliest opportunity.

212. If fatalities occur to members of the public, the police may have a responsibility to investigate the cause of death. As far as possible, the scene must be preserved. A temporary mortuary facility should be designated prior to the event.

213. Emergency access routes at the site should be identified and, in the event of a major incident, should be manned by police officers to ensure clear routes for emergency vehicles.

Other Emergencies

Emergency evacuation plan

214. Emergency evacuation plans should be drawn up. This is the responsibility of the promoter/Licensee. It should be agreed with the emergency services and the local authority. The plan should provide arrangements for:-

identification of key decision-making personnel;

how the concert will be stopped;

identification of emergency routes;

identification of holding areas for the audience;

details of the script of coded messages to management and stewards to open gates etc;

details of the script of coded "stand down" messages;

details of the script of public address announcements to the audience;

details of hospitals in the area prepared for major incidents and secure traffic routes to such hospitals.

215. If a major incident or emergency occurs it is recommended that on no account should music suddenly be turned off. This can cause major public order and crowd disturbance, making the work of police, stewards and first aid staff more difficult. The volume of the music should be reduced gradually, or authorities should wait until the end of a particular song. Announcements should not be left to performers - but their assistance may be enlisted in calming the crowd. Persons making emergency announcements, should work from a prepared script and be experienced in doing so.

Evacuation

Indoor Premises

216. In indoor premises a variable evacuation time of between two or three minutes is acceptable dependent upon condition and construction class.

217. Exit requirements should be based on the following table:

NUMBER OF PERSONS	MINIMUM NUMBER OF EXITS REQUIRED	MINIMUM WIDTH OF EACH EXIT
Up to 200	2	1.100m
200-300	2	1.200m
300-400	2	1.400m
400-500*	2	1.600m

* An additional exit not less than 1.600m in width should be provided for every additional 250 persons or part of 250 persons.

Outdoor Concerts:

218. The evacuation time for the public from any outdoor concert site to a safe place should not exceed 15 minutes.

219. The Home Office's 'Guide to Safety at Sports Grounds' contains advice on emergency evacuation times at certificated stadia. Times depend largely on the level of fire risk present in the spectator accommodation and vary between 2.5 minutes and 8 minutes. This advice and details of exit capacities and notional flow rates may be of assistance in the staging of pop concerts. The different nature of the events and the likely presence of the audience on the playing area will need to be taken into account.

DISABLED PERSONS ACCOMMODATION AND FACILITIES

Introduction

220. Organisers of pop concerts should, wherever practicable, make suitable arrangements to accommodate disabled persons who wish to attend the event. The following recommendations apply particularly to persons confined to wheelchairs and pushchairs but consideration should also be given to the facilities that can be provided for those who have impaired vision or hearing. Advice can be obtained from a number of organisations, including:-

(a) Royal National Institute for the Blind;
(b) National Federation of the Blind of the UK;
(c) Royal National Institute for the Deaf.

Access for Disabled

221. Provisions for the disabled must include easy access and adequate means of escape. Suitable assistance will need to be made available.

222. If the concert is to be licensed, the licensee should indicate, during the preliminary discussions, what facilities are proposed for the disabled.

223. Details of technical requirements can be found in BS 5810 1979 British Standards Code of Practice for Access for the Disabled to Buildings and includes reference to:-

- Approach to buildings
- Doors
- Internal circulation areas
- Lifts
- Internal staircases
- Sanitary convenience access
- Auditoria etc

Indoor premises equipped with permanently fixed seating

224. The admission of disabled persons in wheelchairs at indoor premises of this kind will need to be approved by the licensing authority. Approval will normally depend upon the practicability of arranging a route from the point of entry to the premises to the seat or position to be occupied in the auditorium and the effect this might have on the safety of the audience in an emergency.

225. In considering the suitability of premises for this purpose, a wheelchair accompanied by an able-bodied adult should normally have to encounter no more than one or two steps along the route described above, or no more than six steps where additional assistance can be given by staff.

226. There are three circumstances which need to be taken into consideration:-

(a) Wheelchairs which enter the premises but which are not taken into the auditorium.

(b) Wheelchairs which remain in the auditorium during the performance.

(c) Wheelchairs which enter the auditorium to enable their occupants to reach and leave their seats, but which are removed during the performance.

227. Each person in a wheelchair within categories (b) and (c) above may need to be accompanied by an able bodied adult who should occupy an adjacent seat and be capable of assisting the occupant as necessary.

228. The number of wheelchairs in categories (a) and (c) above which may be permitted on the premises will depend on the amount of suitable storage space available.

229. The number of wheelchairs in category (b) above which may be permitted in the auditorium will depend on suitable space being available. Wheelchairs should not encroach into gangways and/or exits and it is possible that there may need to be permanent or temporary removal of seats.

Indoor premises without seating

230. Because of possible surging movements of a free-standing audience, all wheelchairs should be located in a suitable area where they are not affected. Each wheelchair occupant may need to be accompanied by an able-bodied adult.

231. The arrangements for access to the premises should be as detailed in British Standards BS5588: Part 8 and BS5810.

Outdoor venues

Open Arenas

232. Fully or partially disabled persons in wheelchairs should normally be accommodated in the open arena or on flat terraces as described above.

(a) Manually operated or battery-driven wheelchairs used by disabled persons should be located in an area with direct access to an exit suitable for use by disabled persons or in an area approved by the enforcing authority. Firm surfaces are required for access, escape routes and viewing areas.

(b) In view of the nature of the entertainment, each wheelchair occupied by a fully or partially disabled person might need to be accompanied by an able bodied adult thus ensuring that assistance is readily available when required. This may depend on the type of wheelchair and the disability of the person.

(c) Where surging and dense crowds are likely, disabled persons should be accommodated on a special viewing platform which meets the standards described in the section on temporary stands and viewing platforms below.

(d) It is preferable for persons in wheelchairs to occupy areas within an arena that can be entered directly from the entrance level without the need to negotiate lengthy ramps or shallow steps. If possible, other areas should be accessed by short ramps (1:12) or suitable lifts.

Flat terraces

233. If flat terraces are to be used, access to them should normally not have more than three or four steps. It may be necessary for each wheelchair occupied by a fully or partially disabled person to be accompanied by an able-bodied adult.

Seated terraces

234. If there is a need to use seated terraces at some premises, only disabled persons who are able to leave their seats (with or without assistance) should be admitted to such terraces and each person should be accompanied by an able-bodied adult.

235. In such circumstances, the wheelchairs should be kept in a suitable area specifically allocated for this purpose.

Petrol driven invalid vehicles

236. Petrol driven invalid vehicles should be left in a suitable car parking area and, where possible, the disabled person should be transported into the premises by the wheelchair normally carried in such vehicles. Where a disabled person is unable to leave the vehicle the organiser should, where possible, make arrangements for the vehicle to be located in a suitable viewing area.

Adverse Weather

237. Where an event takes place in the open, consideration must be given to possible adverse weather and suitable means of access should be provided to prevent wheelchairs becoming immobile due to soft ground, etc.

Access

238. The following factors should be considered when assessing how accessible the premises are for the disabled.

General

(i) Is the site accessible to wheelchairs?

(ii) How many facilities are accessible to a disabled person, whether blind, in a wheelchair or with limited walking ability, eg refreshments?

Car parking

(i) Is the access symbol displayed on some reserved spaces?

(ii) Are spaces accessible and wide enough?

(iii) Is the car park situated close to the site, toilets, etc?

Shelters

239. Are shelters provided against bad weather and are these accessible and sufficient for all disabled people?

Footpaths

(i) Are there paths without steps?

(ii) Is the path wide enough? Have passing places been made for wheelchairs on narrow paths?

(iii) Are cambers reduced to the minimum?

(iv) Are ramps and handrails provided where necessary?

Surfaces

(i) Are the surfaces of some paths level and smooth and free from clutter and blockages to help those with wheelchairs and walking aids?

(ii) Are edges clearly defined?

(iii) Is any guidance available for blind people through the provision of tapping rails or distinctive surface colour and texture?

Kerbs

(i) Have kerbs which have to be crossed been removed where possible and ramped?

(ii) Are kerbs provided where necessary for safety and guidance?

Steps

(i) Are steps safe? Are the surface, materials, dimensions and slip resistance suitable?

Ramps

(ii) Is the gradient of ramps too steep? They should not exceed 1:10.

Gates and stiles

(i) Could a person in a wheelchair get through or round the gates and stiles provided?

(ii) Can people with difficulty in walking negotiate the stiles?

Seats

(i) Are seats at a suitable height with arms and backrests? Are 'perches' provided?

(ii) Are they situated at interesting and accessible places?

Sanitary accommodation

(i) Is there a sanitary accommodation suitably designed for wheelchair users?

(ii) Do notices indicate the location of sanitary accommodation, and is the accommodation reasonably close?

Signs

(i) Is information conveyed in a simple, clear way, in contrasting colour and in large writing for those with poor vision to read?

(ii) Are they low enough for a person in a wheelchair to see?

(iii) Has any method been used to convey information to blind people?

Publicity

240. It is helpful if the organisers of events publicise the facilities which are available and ensure that someone is available to deal with queries about these.

241. Facilities can be publicised by contacting:-

(i) the social services department in the appropriate area;

(ii) any local clubs or organisations for the disabled;

(iii) local newspapers and radio stations, including talking newspapers;

(iv) tourist boards and tourist information centres;

(v) national organisations for the disabled who can distribute information to their branches throughout the country;

(vi) 'In Touch' and 'Does He Take Sugar', BBC radio programmes for the blind and disabled, which reach a wide audience and provide an important information exchange.

STAGES

General

Design and Load Calculations etc

242. All structures both indoor and outdoor should be drawn up on a plan and all calculations and drawings checked by an independent competent person. Full technical drawings with supporting calculations should be submitted with the licence application and made available upon request to the enforcing authority.

243. Design loads should be given with these drawings. The recommended loads in appropriate British Standards should be used but other factors which may be relevant as detailed below might need to be taken into account.

Wind loads

244. Wind loads should be as specified British Standard Code of Practice 3, ch.V pt.2 (this is likely to be revised shortly and appear as an 8000 series code). For structures which are to be erected and used for only a limited period, the contractor may use local meteorological office information for the wind speed in the area in question and at the time of year. Information should be obtained, for the previous five years, on the maximum 3-minute gust wind speed for the months when the structure is to be constructed, used and dismantled and for three months either side of this period. The maximum speed indicated by this information should be the basis for the design when multiplied by a factor of 1.5.

Ground loads

245. The employer erecting the stage should obtain information concerning the load bearing capacity of the ground or floor. For outside events the ground load bearing capacity should be for wet conditions.

Loads

246. Staging might be needed for delay towers, television crew, light stands, star screens as well as for the concert stage itself.

247. The deadweight of the load that must be supported by the staging must be ascertained. The deadweight load should include, for example, the weight of the stage, special effects, barriers, personnel and their equipment, lighting, loud speakers, star screens etc. A safety margin of 25% should be allowed for the deadweight load. For live loads, this may need to be higher.

248. Factors such as wind loads should then be taken into account both as regards the extra force that they may generate and the bracing within the structure that will be needed to resist the torque forces generated by the wind.

Stage design

249. Many groups will bring their purpose designed stage with them. Whilst they may be safe in certain conditions, no two venues will be the same and factors such as the load capacity of the ground and weather conditions will vary.

250. Employers will need to ensure that the design of the stage will suit all the venues which are to be used and a report by a competent engineer might be needed for each venue. The licensing authority may employ a structural engineer to check on the integrity and installation of any temporary stage.

251. Stage invasions are a possibility and where audiences exceed 500 persons all stages should be designed for a live load of 7.5 kN/m^2. The load calculation should reflect both static and dynamic forces. This loading should be applied to all areas including wings, performance area and any extension platforms but excluding rostra provided, so that they do not in any way form an extension to the stage.

252. The stage decking should be smooth and flat, and not deflect more than 6mm over a 2m span under the live load.

Stage Access and egress

253. All stages over 1.0m high should be provided with unobstructed access which may be ramps or stairs. The access should be at least 2.0m wide.

254. For stages over 40m^2 there should be a maximum of two ramps arranged either from opposite sides or the rear. There should be a clear vertical headroom over these access ways of at least 2.25m.

255. Any ramp used should have a gradient no greater than 1:5 and extend for no more than 7.75m between horizontal landing areas.

256. Landing areas should be at least 2.0m long in the direction of travel and be at least as wide as the access way.

257. The surface of any ramp should be covered with a non-slip material which will give a maximum coefficient of friction of 0.35 when wet.

258. Any stairways used for access should have risers which are greater than the tread going (ie not exceed a gradient of 1:1). The minimum size of the tread should be 200mm and maximum size of the riser 225mm. Treads should be covered with a non-slip material to give a maximum coefficient of friction of 0.35 when wet. Flights of steps should not exceed 10 risers between landings. Where landings are provided they should be at least 1.5m long in the direction of travel and as wide as the stair access.

259. Round or square hand rails with a minimum width dimension of 48mm should be provided to all stages, platforms and access ways from which a person could fall in excess of 1.00 m except those edges facing the audience. This front area should be clearly marked at least 1m from the stage edge. All handrails should be between 910mm and 1.15m above the standing surface. They should be capable of withstanding a horizontal load of at least 1.5 kN/M run applied at the handrail. Where large numbers of people are to use the stage the loading factors be should increased to 3.00 kN/M run.

260. Where a front of stage barrier is not used the stage front should be solid and should withstand a design load of 5 kN/M^2.

Outdoor Events

261. In addition to the above, for outdoor events:

Where stages exceed 2.4m high and a front of stage barrier is used a minimum platform loading of 5 kN/M^2 may be accepted.

262. All stages should have two points of access/egress either in the form of steps or a ramp. For stages of less than 120m^2 in area a total access width of not less than 2.0m should be provided. For stages that have an area of more than 120m^2, a total access width of at least 4.0m should be provided.

263. Roofs should be provided. All flexible covered roofs should be designed to support the dead load as well as any imposed loads such as water or snow accumulations and wind. The fixing should not fail within 1.5% ±25% of the design load of the supporting structure. It should not be assumed that the roof can be dismantled quickly if loadings are exceeded.

264. Rigid covered roofs should be designed to carry similar loads to those for flexible roofs, however, a live loading of 0.75 kN/M should be added when calculating the safe loading capacity. The coverings should be capable of withstanding the uplift forces caused by the wind load derived from British Standard Code of Practice 3, ch.V pt.2 or calculated from local meteorological information.

265. Designers will need to calculate the uplift forces along the eaves and gable to ensure that the fixings for the roof coverings are able to withstand these forces. They should also remember that some forms of roof covering experience severe vibration in high wind conditions and the vibration can shake loose certain types of fixing as well as cause early structural failure. Where these structures may be subjected to vibration the design should provide for the effects to be dampened down.

266. Roofs are normally constructed at ground level and then lifted into place by block and tackle or a similar arrangement.

Other temporary structures

267. The design calculations, drawings etc as detailed above for staging will be needed for all other temporary structures.

Towers

268. Towers should be firmly fixed to the ground either by staking, guying or counterweight so that they have a **minimum resistance to overturning of at least 3 when the tower is subjected to the worst combination of horizontal forces.** Such turning forces can be created by wind loads, or eccentric loading during the use of the tower. Guying should only be used where the guys and their anchors will not cause an obstruction. All stakes or anchors should be located or covered so that they do not create a hazard.

269. Towers should not be clad unless they are specifically designed to resist the resultant wind loading. When calculating the wind load in any direction the effects of drag created by hoarding, banners or signs, plant or equipment placed in the tower and persons likely to use the tower should be considered and calculated.

270. When calculating the eccentric loads on a tower the position of all equipment and people should be assessed on the assumption that they may be located at the most disadvantagous position. Other horizontal forces that might exist from the use of heaving lines and ladders placed against the outside of the tower should also be taken into account.

271. Wherever possible, loads should be lifted up the tower within its plan area. Similarly, ladder or stair access should be located within the plan area with the ladder footed on the tower itself.

272. Access ways through the tower platforms should not form an obstruction and should be at least 700mm deep by 450mm wide. There should be an intervening resting platform for every 9m ladder run. Where the towers are likely to be left unattended provision is needed to prevent unauthorised access for example by removing lower lengths of ladder.

273. Towers that are located in areas to which the general public have access should be constructed so that their structural sections cannot be removed without the use of specialised tools.

Masts

274. Masts should be constructed so that they have a minimum factor of safety against overturning of 3 when subjected to the most adverse combination of loads.

275. Masts should be constructed so that unauthorised access is not possible. This will not be necessary if they are located in areas which are at all times under the control of the event organisers or their agents.

276. Masts that are hinged should be secured against unauthorised interference by means of a locking mechanism to secure the hinge backed up by a second locking system.

277. Flag poles, banners etc. should not be attached to any structure, particularly handrails etc., unless the structure has been specifically designed to withstand the drag effects caused by the wind.

Lifting gear

278. All items used for lifting should be suitable for their purpose. They should be stamped or marked with their safe working load or accompanied by a certificate giving the safe work load.

279. Appliances used for lifting should be stable and secure when in use. Particular care should be taken in fixing head pulleys.

280. Drums or pulleys should have a diameter at least 10 times that of the rope if wire or 6 times if man-made fibre.

281. Only wire or man-made fibre ropes should be used for lifting. If man made fibre they should be of a type where the extension under maximum permissible working load is less than 5%.

282. Powered winches should be operated only to raise or lower under power (ie should not allow free fall of load). Their operating mode should provide that, if they are released, they stop and the load remains suspended (ie the braking mechanism is sufficient to hold the load and is automatically activated when the power is cut off).

283. Manual winches should not allow the descent of the load by brake only and should hold the load between each stroke of the handle.

284. All hooks used for lifting must be fitted with a safety catch which must be in place during all lifting operations.

285. Wherever practicable the weight of the items to be lifted should be marked on them or given in a certificate associated with the item.

286. The person in charge of all appliances and lifting gear should check them when they are delivered to site and at the start of each day's work. Items that appear defective must be put to one side (preferably in a separate area) and labelled to show that they are unfit for use until a competent person (usually the supplier, manufacturer or insurers engineer) certifies that they are fit for use. Any items that are defective should be removed from the site.

287. Before lifting commences with freshly erected lifting appliances, the lifting arrangements should be tested with a proof load of 1.25 times the safe working load (SWL). This test should only raise the proof load just off the ground to check that the lifting arrangement is satisfactory.

288. All tackle and gear (lifting equipment, wire ropes, chain, shackles, eye bolts, etc) used to support any suspended equipment should comply with the requirements of the relevant British Standard. A current certificate in the form required by current legislation, together with the register of inspection and maintenance of such equipment should be held at the premises. This may be required by the enforcing authority. Regulations are expected to be implemented in 1992 which will revoke a number of existing forms used to record the testing and examination required by various Statutory Orders. They will also change the arrangements for the recording of results of tests and examinations and will provide for the use of electronic means for storage of records of tests of lifting plant and equipment.

289. Each hoist or winch should bear an approved stamp or mark to identify it with the apparatus referred to in the certificate.

290. Power-driven hoists or self-sustaining winches should have an acceptable safety factor. There should be sufficient in number and arranged so that in the event of failure of any one hoist, the whole of the equipment remains in its original position. Power-driven hoists working together on the same structure should have satisfactory synchronising controls to ensure that an even lift is maintained.

291. Any moving or travelling flown equipment used during or in connection with the concert should have -

(a) suitable inertia (load arrester) devices;

(b) ultimate limit switches in addition to the normal "setting" limit switches, should control both the upper and lower travelling distances;

(c) a control switch, which will isolate the power and automatically brake all motors, should be provided for both upper and lower travelling distances;

(d) the operator should have a clear, uninterrupted view of all parts of the moveable equipment;

(e) the whole installation should be tested and operated prior to the admission of the public before each and every performance.

292. Where follow spot operators are positioned on flown trusses or open towers, each operator should have a suitable safety harness and a rolled drop ladder or other suitable means of escape.

Temporary structures

293. All the activities on the site involving erection and construction of temporary structures should be monitored by the event safety officer. The ESO should check that contractors and personnel work safely and carry out the construction of the temporary structures as detailed in the specifications for them.

Requirements of Construction Regulations

294. The enforcing authority may need copies of all method statments relating to the systems of work to be adopted for particular construction and erection work. The employer should pass sufficient copies of all details, calculations, drawings, sketches, etc to the licensing authority before work commences so that the authority may have the opportunity to assess them.

295. The employer should ensure that all structures are checked by a competent person after they have been erected and before they are used, to ensure they conform with the drawings, technical details, etc. Where this check is carried out by a person employed by the contractor erecting the structure, the employer should verify that the checks have been done effectively and have been recorded. The structure must comply fully with the design criteria before the public are admitted on the site.

296. See fire section as regards provision of fire extinguishers for use on the temporary structures.

297. The event safety officer should liaise with the licensing authority before any modifications are made to any structure.

Site Working Practices

298. Equipment brought onto the site should be checked to ensure that it is in a satisfactory condition and meets any specification which has been laid down. Steel items with cracked welds, bent or buckled members or suffering a large degree of rusting should be rejected. Structural timber items having excessive splits, knots, waves or which have suffered from fungoid or insect attack that has significantly weakened them, should be rejected.

299. The workforce should be issued with and advised on the use of suitable protective equipment. Safety helmets, safety footwear; waterproof clothing; gloves, eye and ear protectors should be worn where the work requires it. Safety helmets should conform to BS 5240 (or an equivalent standard). 'Peaked' safety helmets may not be suitable in all cases and where not suitable a reduced peak helmet or a mountaineering helmet may be needed. Flexible headbands and chin straps can help to secure the helmet and enhance comfort factors. From July 1992, new Regulations dealing with all personal protective equipment will come into effect.

300. Where persons are liable to fall a distance of more than 2m, then the requirements of the Construction (Work Places) Regulations must be followed. This means that guard rails of not less than 910mm and not more than 1.15m high must be provided. Where it is not practicable to provide guarding, safety sheets must be provided. If it is not practicable to provide safety sheets or nets then safety belts or harnesses must be provided. Where safety belts or harnesses are worn they should be clipped by means of karabiners or safety hooks to a safety lanyard. In the case of safety belts the fall should be arrested within 0.6m and for safety harnesses, 2m. These then should be clipped to a suitable anchorage. It may be helpful if the belt is fitted with a lanyard on either side which can be used alternatively as work moves about. Where harnesses are used these could be attached to tensioned safety lines or lines running from inertia reel blocks.

301. While structures are being erected, material should not be lifted over the heads of persons working or passing below. Wherever possible "no go" areas should be created below these working areas and other workers and members of the public excluded.

302. During lifting operations, persons should be kept away from areas below the lift. Where lifting is to be done without a winch this should be done from the ground over a pulley, gin wheel or block and tackle at the top of the tower. As this method can induce large horizontal forces on the tower the employer should ensure that the tower is adequate for the purpose. Further information for persons in charge of lifting operations is available in HSE Summary Sheet SS5, Suspended Cradles and Small Lifting Appliances.

303. Where items are being passed up a tower etc by means of a line, no personnel should be allowed in the area immediately below or adjacent to the load.

304. Where work takes place at night suitable and adequate lighting should be provided. This must be of a standard that comfortably illuminates the work area, so that people can see their work clearly, and which does not create excessive shadows that could obscure hazards (see paragraph 378 on lighting levels).

305. Dismantling of structures should be done methodically, with items being handed or lowered down and placed in orderly stock piles. Items should not be dropped or "bombed". Timbers should be denailed as they are removed. Items that could be blown around by the wind and so cause a hazard should be properly secured.

Proposed Manual Handling Regulations

306. At present the health and safety aspects of manual handling are governed by the general duties in Sections 2 and 3 of the HSW Act and by weight-based sectoral legislation covering factories, offices, shops, railway premises, construction, agriculture, mines and quarries. HSE has found that this legislation has been ineffective in preventing manual handling accidents and to a large extent unenforceable.

307. HSE are therefore proposing new regulations on manual handling, based on the EC Directive on manual handling and associated guidance. In brief, the Regulations propose that employers should so far as is reasonably practicable avoid the need for manual handling or, where it cannot be avoided, should assess their manual handling operations taking account of all the factors involved (nature of the load, nature of the task, nature of the working environment, individual capabilities) and where there is a risk of injury to workers take steps, so far as is reasonably practicable, to avoid or reduce that risk. HSE are proposing that the new Regulations come into force on 1 January 1993.

Siting

308. The choice of location may be limited but several factors need to be considered:

(a) load bearing capacity of the ground

(b) gradient or unevenness of ground

(c) drainage

(d) availability of main services

(e) access and egress for audience and emergency services

(f) overhead power cables

(g) proximity of buildings in relation to fire risks.

309. A thorough inspection of the site is needed before any work starts on assembling stands etc. The load bearing capacity of the ground should be accurately assessed, settlement etc can cause instability. The ground may have been back-filled. The site should be prepared and maintained, in order to provide an even surface for areas to which the public have access.

310. Where possible, trenches should not be dug around a stand, particularly near any stanchions. Unfilled trenches should be covered with a suitable material which is capable of withstanding the load and fixed in such a way to avoid tripping hazards. Where work is carried out in trenches, the sides of the trench must be supported against collapse; trenches less than 1.2m deep may not need to be supported. Further guidance is available in the HSE Summary Sheet SS8 - Safety in Excavations.

311. Temporary stands erected inside buildings should have their main access ways directed towards the building exits. At least 1.6m of access way should be left between the stand and the perimeter wall. Stands erected outdoors should have access gangways directed towards areas where the crowd may safely disperse over ground that is even and free of excavations or other obstructions.

Stability

312. All stands, platforms, etc should be capable of withstanding any load or force to which they may be subjected and account should be taken of any external factors such as wind loads. A safety factor of 25% should be provided. Crowd movement both on and around them can result in temporary load forces. This can produce temporary instability.

313. Stands and platforms should be designed to ensure that failure of any large piece of the structure or connection would not render the structure unstable. As far as is practicable the area around the supporting frames should be secured to prevent unauthorised access and frames should be so designed that they are firmly locked into position and cannot be tampered with by unauthorised persons.

314. All stands should be firmly founded on suitable base plates or sole plates.

Assembly

315. The assembly of temporary stands and viewing platforms is regulated by the Construction (General Provisions) Regulations 1961, the Construction (Working Places) Regulations 1966, and the Construction (Lifting Operations) Regulations 1961. The work should be carried out in accordance with plans and specifications drawn up by a competent engineer.

316. The assembly of stands should be carried out by or under the supervision of competent persons trained in the proper performance of such work.

317. The sequence of erection should be arranged so that guard rails are fitted as workers move into the area. They should not be expected to work beside an open edge, although they may work at an open edge without guard rails where it is not reasonable to fit them. In these circumstances safety nets should be

provided. Where it is not practicable to provide safety nets, suitable anchorages for safety harnesses should be supplied and safety harnesses worn. The system of work should ensure that checks are made to ensure that safety harnesses are worn and properly secured.

318. Toe boards should be provided with guard rails to prevent objects falling off working platforms and to prevent workers falling across the platform and over the edge.

319. Side netting may be needed in addition to toe boards where there is a serious risk of items falling off the platform.

320. Lighting should be sufficient to allow work to be carried out safely. No assembly or dismantling work should be carried out when members of the public are at risk (see paragraph 378 on lighting).

321. The assembly work should be carried out according to a safe system, using correct parts and components of proper size and design. Care should be taken with the handling of components to avoid damage or distortion.

322. All components should be closely examined during assembly and dismantling for signs of wear, deformation or other damage, and where necessary replaced by sound components of matching material properties and dimensions. Temporary repairs using makeshift components should be avoided. Care should be taken to ensure all components are correctly aligned. They should not be bent, distorted or otherwise altered to force them to fit. On completion, assembly work should be checked with particular attention given to fastenings and connections.

323. Persons erecting the stands should work from the ground or from suitable stable platforms, mobile working platforms or ladders (see HSE Guidance Note GS42 - Tower Scaffolds for further information).

324. Where ladders are provided to enable workers to reach higher levels, they should extend to at least 1m above the working platform and should be firmly secured in position. They should be placed ideally at an angle of 75° to the horizontal or 1m out for every 4m in height (see HSE Guidance Note GS31 - Safe Use of Ladders for further information).

Exits

325. All stands should have suitable and sufficient exits to allow egress. The greatest risk to crowd safety is during egress. A smooth and unimpeded passage through the exit routes should be established.

326. All persons should be able to leave the stand within 8 minutes.

327. In determining the number of exits required a flow rate of 40 persons per minute per unit at exit widths (550mm) should be assumed. An exit should always be at least 1.1m wide with a minimum headroom of 2.4m. All exit routes should be clearly signposted.

328. Every stand should be provided with sufficient gangways to allow the orderly and safe evacuation from the platform of all spectators. Gangways should be positioned to provide access to all exits and should be a minimum of 1.1m wide.

329. No person in any part of the stand should have to travel more than 30m to the nearest exit or safe area.

330. It is important that the natural resonance time for stands does not coincide with the resonance which could be induced by crowd movement as this may cause failure of the stand. Crowds cause vibrations generally at frequencies below 6Hz (see also The Institution of Structural Engineers document "Safety considerations for the design and erection of demountable grand stands").

331. In all cases there should be an unobstructed passage of at least 305mm between the back of one seat and the front of the seat immediately behind.

332. The number of seats in a row should not exceed:

(a) 7 seats where there is a gangway at one end only. However, longer rows of up to 22 seats with a gangway at each end may be acceptable if the passage is increased by 25m for each seat over 7; and

(b) 14 seats where there is a gangway at each end. However longer rows of up to 22 seats with a gangway at each end may be acceptable if the passage is increased by 25mm for each additional pair of seats and/or any odd seats over 14.

All seats should be securely fixed in position.

All stairways and ramps etc should comply with the recommendations in paragraphs 127-140.

333. For marquees and canopies on stands, allowance should be made for the increased wind effects produced. Where there is a possibility that stands could remain in use in strong wind conditions, assumptions about the area exposed to the wind should include people on the stand. Persons could be assumed to present a $0.75m^2$ area to the wind, although a solid barrier 1.8m across the stand may more effectively represent the crowd.

TENTS/MARQUEES

Siting

334. Tents and marquees should be erected, so far as is reasonably practicable, in a sheltered place. Whenever possible the smaller side should be arranged to face the prevailing winds.

335. Grass should be cut as short as possible before erecting the structure and cuttings should be raked clear. In exceptionally dry weather the site should be watered before erecting the tent or marquee.

336. Tents and marquees should sited away from special effects such as firework displays. Their entrances should be adjacent to the access routes which people will take who are likely to use them.

337. Where practicable they should be separated from vehicular routes. Where not practicable and damage to the marquee or tent and their supporting guy ropes is foreseeable, a fence or other suitable barrier should be provided to protect them.

338. Pedestrian routes should so far as is reasonably practicable be kept clear of any guy ropes or stakes. Where it is expected that a high pedestrian flow may pass, suitable barriers should be erected and stakes suitably covered to avoid hazards.

339. Supporting poles, frames, guy ropes and stakes, anchors, fastenings, etc should be in sound condition. The structure should be erected by a competent person. Secure anchorages should be made to ensure that the marquee or tent is stable and maintains its correct shape. Guy ropes should be taut but not over-tensioned.

Stability

340. All tents and marquees should be capable of withstanding wind forces and other loadings caused by snow build up or heavy rain.

341. The stability of the main tent poles and supporting structure should be independent of the sheeting fabric, ie any tearing or defect occurring in the fabric should not result in the collapse of all or any part of the main structure.

Arrangements within the tent/marquee

342. All seating and gangways should be in accordance with paragraphs 325-332.

Exits

343. The minimum width of any exit should be fixed according to the number of occupants who may have to use it and should be in accordance with the table below.

Min clear width of exit	Number of persons
1.05 Metre	1 - 160
1.65 Metre	161 - 240
1.95 Metre	241 - 320

344. Where the tent or marquee is intended to hold more than 50 people there should be at least 2 exits and an allowance should be made for the fact that one exit may be obstructed and not available because of fumes, smoke or other hazards.

345. Exits should be distributed evenly around the tent or marquee so that genuine alternative routes are available.

346. From any part of a tent or marquee having more than one exit, the distance of travel to the exit should not exceed 18 metres.

347. Where there is only one exit, the distance of travel should not exceed 6.5 metres.

348. In determining the distance of travel an extra factor should be added where there are temporary ramps or stairways en route. 0.25 metres should be subtracted from the distance of travel limit for every 1 metre of ramp or stairway.

Flooring

349. Within tents and marquees flooring is of particular importance as a major cause of accidents is slips, trips and falls.

350. Where reasonably practicable floor levelling and covering should be provided.

351. Cooking appliances should be positioned well clear of the fabric of the structure.

Fire

352. A major risk with tents and marquees is fire. It is the employers responsibility to assess the fire risk and wherever possible to remove that risk. Where this is not practicable then suitable precautionary measures should be taken eg through the provision of fire extinguishers.

353. Wherever practicable the tent and marquee should conform to the requirements of the Fire Precautions Act and the advice of the Fire Services on fire precautions and emergency evacuation should be obtained.

354. Appendix X (not included) describes the type of fire extinguishers that are available and their uses. Suitable types of extinguisher should be provided to deal with the individual risks eg electrical, flammable gases, etc.

355. Bottled gas cylinders should be stored outside tents and marquees in secure and appropriate storage (see HSE Guidance Note CS4).

356. General information can be found in the Guide to Fire Precautions in Existing Places of Entertainment and Like Premises, (Home Office/Scottish Office publication).

357. A variety of hazardous substances may be used or may arise at pop concerts, particularly as a result of special effects. They range from chemical agents such as paints and adhesives, to smoke generated from fireworks and effects machines, as well as the chemical agents in some of the machines themselves. Many everyday substances can also be hazardous, for instance cleaning agents, such as bleach.

358. Exposure to hazardous substances is subject to the Control of Substances Hazardous to Health Regulations (COSHH). Under COSHH, employers must assess both the risks arising from workplace exposure to hazardous substances and the measures necessary to achieve and sustain prevention or control of exposure.

359. Wherever feasible, exposure to hazardous substances should be prevented by elimination or substitution with a less hazardous alternative. Where this is not feasible, exposure must be adequately controlled. To achieve this, COSHH requires that other more effective measures are used before resorting to personal protective equipment. The latter should be seen as an additional "last resort" and if it is required, management systems to ensure it is properly worn are essential.

Asphyxiant gases

360. Asphyxiant gases, such as nitrogen and carbon dioxide which are used to create smoke effects, can kill through starving the victims of oxygen. Nitrogen and carbon dioxide at normal temperatures and pressures are colourless, odourless gases.

361. In normal use, these special effects do not cause problems, but workers and artistes should not lie down in special effect smokes. Confined spaces, such as natural wells, eg pits, and areas under the stage, should be well ventilated. If any doubts exist, the atmosphere should be tested, prior to entry, to ensure that oxygen levels are adquate.

ELECTRICS

General

362. Electric shocks at concerts are not uncommon. Electric shocks can be fatal whilst others have resulted in persons being incapacitated. Only a small current ($^1/_{20}$ amp) is needed to upset the heartbeat, possibly causing cardiac arrest.

363. The employer will need to assess the requirements for electricity and assess whether existing provisions are satisfactory. If they are not, it will be necessary to make safe provision for the electricity that is required.

364. All electrical installations, including temporary installations, should comply with the current edition of the Regulations for Electrical Installations issued by the Institution of Electrical Engineers. Reference should also be made to HSE Guidance Note GS50 'Electrical Safety at places of entertainment.'

365. BS 4343 "Specification for industrial plugs, socket outlets and couplers, etc" may be relevant where electricity has to be used in areas of higher risk, eg wet conditions or where there is a potential risk of damage to cables.

366. Employers will also need to assess whether the electricity supply is compatible with the equipment to be used. This may be a particular problem with concerts which feature artists from abroad.

367. The designs and types of electrical connections will also need to be taken into account so that low voltage equipment, such as electric guitars, can be connected via an amplifier into the mains supply. Equipment which uses alternating current (AC) and extra low voltage battery supplies must be clearly identified.

Where electricity will be required

368. Electrical installations at concert sites particularly at large outdoor events can be complicated and extensive. Items of equipment etc may be incompatible and incorrect connections may cause operational and safety problems. The services of a competent electrician or electrical engineer are essential for such events.

369. Electricity will be required for the following uses:-

normal lighting circuits

escape lighting circuits

setting up (hoists, portable tools, etc)

marquees, portacabins, etc used as emergency centres

stage and effect lighting

audio systems: site
stage

miscellaneous power supplies eg heaters, catering equipment, electric motors

Normal lighting circuits

General

370. All parts of the premises accessible to the public and all parts of the premises authorised for use by other persons, should, if intended for use in the absence of adequate lighting levels be provided with means of normal lighting by electricity.

Areas for lighting

371. Areas to be provided with illumination may include pedestrian access to car parks, car parking areas and access routes to public highways. This may be particularly important when concerts are held in large open spaces. Provision for lighting surrounding areas will depend on individual sites and existing lighting provision.

372. All 'Exit' notices and directional notices indicating routes of escape should comply with the relevant British Standard and should be illuminated by both the normal and the escape lighting.

373. In premises where exit signs and other directional notices may need to be viewed from long distances, particular attention should be given to the quality and intensity of lighting and the size of any notice.

Escape lighting circuits

374. In addition to the normal lighting arrangements, all parts of the premises accessible to the public and all routes of escape from parts of the premises should, if they may be used in the absence of adequate lighting levels, be provided with a system of escape lighting supplied from a source of electricity independent of the normal lighting. The escape lighting should be of a maintained type (continuously illuminated). General guidance is available in British Standard 5266.

375. Any source of supply used for providing escape lighting should be capable of maintaining the full lighting load for not less than 3 hours in the event of failure of the normal supply. Any battery used for this purpose should be in a fully charged condition whenever the premises are in use.

376. Where the alternative supply is by means of a generator the fuel supply should be capable of maintaining the full lighting load for not less than 3 hours.

377. The cut-in arrangements for the generator should be tested prior to entry of the public before each performance.

Lighting levels for means of escape

378. The illumination of the premises should be maintained at all times at a level which will enable attendants or other staff to keep effective control of the audience. Both systems of lighting, normal and emergency, should each be sufficient to provide a level of lighting which enables the occupants of the premises to see their way to a place of safety outside the premises.

Average illuminances and minimum measured illuminances for different types of work

General Activity	Typical locations/types of work	Average illuminance lux (lx)	Minimum measured illuminance lux (lx)
Movement of people, machines and vehicles[1]	Vehicle parks, corridors, circulation routes	20	5
Movement of people, machines and vehicles in hazardous areas; rough work not requiring any perception of detail[1]	Construction site clearance, excavation and soil work	50	20
Work requiring limited perception of detail[2]	Kitchens, factories assembly work involving large components	100	50
Work requiring perception of detail[2]	Offices	200	100
Work requiring perception of fine detail[2]	Drawing offices, assembly work involving electronic components	500	200

Notes

1 Only safety has been considered, because no perception of detail is needed and visual fatigue is unlikely. However, where it is necessary to see detail to recognise a hazard or where error in performing the task could put someone else at risk, for safety purposes as well as to avoid visual fatigue the figure should be increased to that for work requiring the perception of detail.

2 The purpose is to avoid visual fatigue; the illuminances will be adequate for safety purposes.

Detailed guidance on lighting levels is available in HS/G 38: Lighting at Work

379. The control for operating the normal and the escape lighting systems should not be accessible to unauthorised persons.

380. The normal and escape lighting systems should be installed so that a fault or accident arising to one system can not jeopardize the other.

381. In the event of either the normal or the escape lighting system failing and the natural source of lighting is not sufficient, the concert should be terminated. The public should be required to leave the premises within a maximum period of one hour. An announcement to this effect should be made over the public address system, which should be independent of both lighting systems, and the announcement should be repeated at suitable intervals so the audience is kept informed.

Access to control systems

382. A clear working space should be provided to facilitate access to -

(a) control switches and equipment;

(b) amplification equipment;

(c) any special effects equipment, eg smoke-producing, follow spots, etc.

383. The dimming equipment should be sited in an approved position and be under the control of a competent person whilst the public are on the premises.

384. Any neon lighting installation should comply with British Standard 559 and any associated high voltage flexible cable should comply with British Standard 5055.

Stage and effect lighting

385. The electricity supply to the stage should be controlled by a switch or switches, installed in a position readily accessible to authorised persons in the stage area. The switches should be able to isolate the circuit on both poles in the case of single phase supply or on all live poles in the case of polyphase (3 phase) supply.

386. Electricity should normally be the only illuminant provided on the stage. However, other types of illuminant may be proposed for effect purposes. Each proposal of this nature would need to be the subject of a special case which will be considered on its merit.

387. Where necessary to prevent contact with scenery or other combustible material or with any person, all lamps, lighting appliances and any other apparatus liable to reach a high temperature should have efficient guards.

388. Stage lighting equipment should not be suspended over the parts of the premises occupied by the public.

389. Any lantern or other lighting apparatus suspended within the stage area should have a safety chain and provision should be made to intercept any portion of the apparatus which might become detached. The weight of any flown lighting equipment should not exceed the safe working load of any securing points provided at the premises. Any flown and/or suspended equipment, including lighting bars and amplification equipment, should have secondary means of suspension which is capable of holding the equipment, should one or more of the primary suspension fail. Each suspension should be secured to independent fixing points on the flown equipment and the structure.

390. Heavy pendant fittings or apparatus should, unless directly fixed to the permanent infrastructure, be provided with at least two non-combustible means of suspension independent of the conductors.

NOTE: Normally suspension ropes (both primary and secondary) should be of flexible steel or metal chain.

391. Scaffolding, metal frameworks, bars & booms on which electrical equipment is fixed should be efficiently earthed.

Cabling

392. All temporary overhead electrical wiring should be securely fixed in position or supported by a catenary wire which is out of reach of the public and arranged so that no undue strain is placed upon the conductors or insulation of the cable. Where cables cross vehicle access routes they should be not less than 5.8 metres above ground level. The catenary wire should be earthed.

393. Cables installed underground, should be placed at sufficient depth approximately 455 mm (18") to avoid any risk or damage.

394. All cables should conform to the relevant British Standard and be installed in accordance with the appropriate table in the Institution of Electrical Engineers Wiring Regulations. Cables used on stage or for stage equipment should be flexible, rubber/PVC-insulated and sheathed as specified in British Standard 6007 or be of equivalent quality.

NOTE: Reference should also be made to the relevant sub-sections of British Standard 5550 in regard to the Code of Practice for distribution of AC electricity for location lighting.

395. All electrical equipment apparatus should be installed so that it cannot be interfered with by the public or unauthorised workers.

Generators and transformers

396. Where generators are used to supply power there is a need to exercise particular care. More detailed advice and information may be found in the HSE documents - Electrical Safety for Entertainers and Electrical Safety at Places of Entertainment. (Guidance Note GS50).

397. Where applicable, transformers should comply with the requirements of the relevant British Standards or equivalent and installed in accordance with the Institution of Electrical Engineers Wiring regulations (non-statutory). Particular attention should be paid to isolation transformers, see Regulation 413-06 of the Institution of Electrical Engineers Wiring regulations.

398. Each item of apparatus (eg smoke-producing machines, follow spots etc) should be provided with a local means of isolation, suitably placed for ready operation. This isolation may be a plug and socket of suitable rating and suitable for the environment.

399. Colour filters for effects lighting etc should comply with British Standard 3944 : 1965 and should also be given an additional test for flammability in accordance with British Standard 2782 : Part 1 Method 140D : 1980 or equivalents.

400. Exposed metal work of all apparatus and extraneous fixed metal work such as lighting bars, metal stage work, scaffolding etc should be effectively bonded to earth.

401. Any electrical equipment used in association with hand held devices, eg microphones, should be protected by a Residual Current Device (RCD) having a 30 mA tripping current. At permanent sites, RCDs should be tested when the device is set up and should then be operated by the test button at least monthly and tested annually. Where a venue is temporary, the RCDs should be tested each day before the event starts.

402. All equipment likely to be exposed to weather, corrosive atmospheres or other adverse conditions, should be constructed or protected to prevent dangers arising from this kind of exposure - see BS 4343 'Specification for industrial plugs, socket outlets and couplers, etc'.

403. A suitable competent electrician should be on the premises during the whole time the public are present and the premises are operating under their licence.

NOTE: It may be necessary for there to be more than one electrician on the premises, ie one present on the stage and others around the premises. This may be a particular need for large outdoor concerts. It is also important that attention is given to the means of communication between the electricians and management.

404. On completion of any electrical installations, whether temporary or permanent, an electrical certificate in the form prescribed in the Institution of Electrical Engineers Wiring regulations signed by a competent person, should be submitted to the employer.

405. All electrically powered equipment should be inspected routinely and tested periodically in accordance with the Electricity at Work Regulations. It is recommended that a record be kept of these inspections and tests.

406. Further references are the -

Electricity at Work Regulations 1989 and Memorandum HS(R)25;
Electrical Safety for Entertainers (Booklet) IND(G) 102L; and
Electrical Safety at Places of Entertainment (GS50); ISBN 0-11-8855980

SPECIAL EFFECTS

LASER SAFETY

407. Laser displays are now widely used in the entertainment field. Where an audience is present, the use of lasers which have the power to exceed the maximum permissible exposure (MPE) limits in a few micro seconds needs to be carefully managed if harmful effects are to be avoided.

408. The British Standard (BS 7192: 1989, Radiation Safety of Laser Products) groups Lasers into four main classes. They range from Class 1 laser products, which are inherently safe, to Class 4 laser products, which are potentially extremely hazardous. Class 3B and Class 4 lasers will cause eye damage if viewed directly.

409. No performer, crew member or member of the audience should view laser radiation which exceeds the MPE. In the event that viewing of radiation is not intended but accidental, levels to which they may be exposed should not exceed the accessible emission level (AEL) for Class 3A laser products. Some medications, alcohol or any other drug may modify these reflexes and thus reduce the margin of safety.

410. BS 7192 requires that for laser installations where lasers of higher class than class 2 are operated, a laser safety officer should be appointed by the user. It is the laser safety officer's task to review the precautions necessary to operate the laser safely, and to advise on appropriate controls.

411. In the case of laser products higher than class 2 which are used for display purposes, it may not be necessary to appoint a specific laser safety officer for each individual permanently installed laser product if the installation has been carefully planned and carried out and there are full written operating procedures. However there will be some displays, eg, certain temporary installations where it will be necessary to appoint a laser safety officer for the duration of the display.

412. Each supplier or operator should have access to someone, either an employee or an external consultant, who is capable of performing the duties of a laser safety officer. They should advise on the safety aspects of any new installation, examining the equipment itself, its incorporated safety devices

and systems, and considering the adequacy of the handover documentation. The licensing authority will normally ask to see a copy of the PM19 certificate, which gives details of the lasers to be used. This document should be specific to the premise or site where the laser display is to occur and should include sketches which apply to both plan and elevation and include relevant distances and dimensions.

413. Handover arrangements should provide for a 'handover certificate' containing a detailed specification defining the intended scope of the display. The contents should have been agreed with the display organisers. The operator should not deviate from the specified arrangements.

414. Where open air displays are given, security is particularly important to ensure that the installation is not interfered with. Adverse weather conditions, nearby traffic movements and such factors as unintended reflections from surrounding structures should be taken into account.

STROBE LIGHTS

415. The use of strobe lights at pop concerts should be carefully considered. Flicker sensitive epilepsy is a rare condition which may be triggered by a variety of environmental factors of which the television is the most potent source. Although rare, the flicker-sensitive individual is most likely to experience a full tonic clonic seizure if an episode is triggered.

416. If flicker rates are kept below 4 flashes per second then only 5% of the flicker-sensitive population will remain at risk of an attack. This flicker rate applies to the overall output of any group of lights directly viewed but not to banks of lights at an angle to the direction of gaze.

ULTRA VIOLET LIGHT

417. Ultra violet light is sometimes used at pop concerts to produce a fluorescent effect on clothing or stage scenery.

418. Great care needs to be taken to ensure that lamps are used correctly in order to prevent exposure to the more hazardous UVB radiation. Some lamps have a double skin whereas other manufacturers provide lamp housings which have separate filters to remove UVB radiation. The lamps should not be used if the

outer skin is broken or if the housing filter is not in place. Operators need to know the emission characteristics of the lamps being fitted to achieve the required spectral distribution. When replacing lamps or other components which could affect the radiation output, it is important that the manufacturers' advice is followed.

419. There may be significant exposures to performers or backstage staff during rehearsals or set manufacture and painting. Control of exposure can be achieved by limiting exposure duration or increasing the distance from the source, taking account of information supplied with the equipment.

420. Some people may have an abnormally increased sensitivity to the effects of ultraviolet light on the skin. This may be a consequence of one of a number of uncommon medical conditions, or result from exposure to a sensitising chemical which may be a prescribed drug. Such sensitisation may result in an exaggerated sunburn response or in more varied and less well localised skin changes. Anyone who develops an abnormal condition affecting the light exposed areas of the body may have become photosensitised. Further occupational exposure to ultraviolet light should be stopped and the individual should be advised to seek medical advice.

PYROTECHNICS

421. The term 'pyrotechnics' covers a wide variety of explosive devices embracing fireworks, as defined in BS 7114: 1988, Part One, and pyrotechnic devices, including theatrical and film effects, flares and signal rockets, which are not subject to BS 7114.

422. All pyrotechnics are potentially dangerous and should be used strictly in accordance with manufacturers' and suppliers' instructions and recommendations. In no circumstances should 'home-made' pyrotechnics be used.

423. HSE has promoted the need for a Firework Standard to provide a detailed national specification which could be used by importers as a contract condition to be met by overseas manufacturers. It has been agreed that the British Standard 7114 will be adopted as a base from which a European Standard will be developed. The British Standard provides a unified approach to categorisation, labelling and performance of fireworks with a greater number being tested than before. Part 1 classifies fireworks into 4 categories -indoor, garden, display

and "Not for Use by the Public". Each category for public use has the types within it listed, eg sparkler, banger, rocket, etc. Part 2 gives the requirement for each type. For example, one of the specifications for a Roman Candle is that it remains upright while functioning. Part 3 lists the methods for testing the various attributes for each type.

424. A licence issued by HSE is required for the importation of pyrotechnics into the United Kingdom.

Associated risks

425. An assessment of the potential hazards associated with the firework display must be made at an early stage in the planning of the concert and the display arranged in accordance with the various sources of guidance available. This includes the reference material noted in paragraph 427, guidance/ instructions from the manufacturers or suppliers of the devices to be used and the advice and experience of the display operator.

426. All parties involved with the production of the pop concert should be informed of the arrangements that will be made. These should include the safety precautions to be taken into account for the particular site layout, position, etc. The organiser of the concert should ensure that he or she is provided with the names of those who will control the pyrotechnics at the event. This will enable communication to be made if emergencies occur.

427. Examples of the known hazards associated with the use of pyrotechnics are:

- fire and explosion during the setting-up operation

- fire and explosion in storage

- premature ignition

- poor electrical systems associated with electrical ignition

- proximity of pyrotechnics to flammable materials

- unexpected behaviour of the pyrotechnic (due to faults in manufacture/poor storage/poor rigs for support, etc)
- noise exposure from fireworks (particularly of those persons who regularly work with them)
- use of pyrotechnics in "confined spaces". Explosives can produce significant quantities of carbon monoxide, carbon dioxide, nitrogen oxide gases, sulphur dioxide and other toxic gases
- poor crowd control around the display areas
- failure to make adequate emergency provision (Police, Fire Authority, fire fighting equipment, means of escape, first aid, etc)

Reference Material

(a) "Code of Practice for Pyrotechnics and Smoke Effects" - Association of British Theatre Technicians, 9 Fitzroy Square, London W1P 6AE.

(b) "How to Run a Firework Display" - A Guide for Organisers - Department of Trade and Industry leaflet

(c) BS 7114: 1988 (Parts 1-3), available from the British Standards Institute.

(d) "Guide to Fire Precautions in Existing Places of Entertainment and Like Premises" the Home Office/the Scottish Office.

Key points

428. Consent should be obtained from the Licensing Authority before pyrotechnics are used. Application should be in writing at least 7 days before the concert detailing the proposed use and the date and time on which a demonstration/rehearsal can be given.

429. Pyrotechnics which are suitable only for use outdoors should not be used inside any building or temporary structure.

430. A competent person must have overall responsibility.

431. Detailed guidance on the main safety precautions which should be taken can be obtained from the reference material listed above or from the manufacturers/suppliers of pyrotechnics. This should cover such aspects as the need for protective equipment, arrangements for ignition, checks of the site after the display, etc.

SOUND AND NOISE

Assessing the task

432. As part of evaluating the event, the concert promoter should make an assessment of the public address and concert music systems.

433. The assessment will need to take into account the position of loudspeakers; the likely distribution and density of the audience; sources of other sounds which might affect the level at which the public address and the concert needs to be transmitted; and the environmental impact of noise levels outside the concert venue. The number of people attending the concert will affect the general background noise and the sound levels and distribution.

434. The quality of all sound systems should be checked to ensure that the output is not garbled and is clearly audible and intelligible in all parts of the concert venue. A competent person should be consulted on the types of sound systems which need to be used for a particular venue as well as the siting of the loudspeakers. Advice should also be sought on measures to avoid interference between one sound system and another.

435. For outdoor events, the weather will also have an effect on the levels at which messages and the concert music will need to be transmitted. For example, on still hot nights, sound levels at the transmission points will not need to be so high as in windy conditions.

436. Sound transmitted through the ground and staging, particularly bass and sub-bass levels of high energy can have an effect on the structures as a result of resonance induced in the structure and this potential effect must be carefully evaluated and considered. The evaluation should include an estimate of the event L_{Aeq} in areas which will be occupied by workers and the audience.

437. The site itself, particularly an open-air site, will dictate where loudspeakers and delay towers are needed and will affect the levels at which messages and music will need to be transmitted. For example, slopes and banks on the site may focus broadcasts or create dead areas. Problem areas will need to be identified and steps taken to overcome any difficulties.

438. Structures to carry loudspeakers must be built to comply with recommendations in the section on temporary structures below. They must be protected against unauthorised people climbing them or from interference. In an emergency, their efficient operation could well make the difference between life and death.

Health effects

439. Where an individual is exposed to loud sound over a period of time, damage will occur to hearing. Such damage may initially be imperceptible and unspectacular although it can begin at an early age. Loud music, like other kinds of exposure to loud sound, can cause permanent hearing damage.

440. Noise induced hearing loss can occur to all musicians. Clinical literature suggests that musicians can have permanent hearing threshold shifts linked to the length of their exposure and its loudness.

Risks

441. Workers who may be exposed to hazardous sound levels include: musicians; sound recordists; security staff; stewards; first-aid staff; stage hands; DJs; merchandising staff; and local authority representatives.

442. The public is also at risk, particularly as exposure to loud sound at musical events will add to other sources of exposure, for example, exposure through noisy jobs and other leisure activities which create hearing loss, eg shooting and flying model aircraft.

Exposure of workers at concerts to noise

Introduction

443. The Noise at Work Regulations 1989 apply to all persons at work during a concert. The Regulations place duties on employers where an employee is likely to be exposed to noise at or above three action levels. They also place duties on the self-employed and employees. Advice on the requirements of the Regulations is given in HSE Noise Guides 1-8.*

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* 'Noise at Work' HSE Noise Guides 1-2, HMSO ISBN 0 11 885512 3, price £3.
HSE Noise Guides 3-8, HMSO ISBN 0 11 885430 5, price £3.

444. The primary employers for concerts are the promoter, the production company, the licensee, the performers and the licensing authority. This is not an exhaustive list and other employers will have duties under the Regulations.

The Noise at Work Regulations 1989

445. An assessment of the sound levels must be made where employees are likely to be exposed to any of the three action levels described below. The high levels of sound which might be needed for the audience to enjoy the concert are likely to mean that employees working for any length of time during the concert within direct lines of any operational loudspeakers will be exposed to the first action level or above.

Definitions of terms

446. The three action levels are:

First Action Level- A daily personal noise exposure (L_{EPd}) of 85 dB(A).

Second Action Level- A daily personal noise exposure (L_{EPd}) of 90 dB(A).

Peak Action Level- A peak sound pressure of 140 dB re 20μPa.

447. The personal noise exposure L_{EPd} is the total exposure over the working period taking no account of the use of any ear protectors. The peak sound pressure is the highest pressure reached by the sound wave during the measurement period.

448. Where an employee is likely to be exposed at or above any of the action levels, employers must provide information, instruction and training on -

(a) the risk of damage to that employee's hearing that such exposure may cause;

(b) what steps that employee can take to minimise risk;

(c) the steps that that employee must take in order to obtain personal ear protectors; and

(d) that employee's obligations under these Regulations.

449. Wherever reasonably practicable, areas where ear protection must be used should be marked, using the sign shown in HSE Noise Guide No 1. Advice on ear protection is given in paragraphs 455-459 below.

Programme of Measures to reduce exposure

450. The employer has a statutory duty to reduce the risk of noise-induced hearing loss. There are three main ways to reduce exposure:

(i) Sound Control Engineering

(ii) Job Rotation

(iii) Ear Protection

Sound control engineering

451. The use of sound control engineering can reduce exposure for all employees, although it is unlikely to reduce exposure to below the first action level. Nevertheless, it can be valuable as a way to reduce overall sound levels where used in conjunction with other methods, for example the noise control measures described in paras , which should help to control the sound directly from the source at the loudspeakers. Additionally, the use of delay towers to distribute sound around the arena will reduce the high sound emissions usually experienced from a single bank of speakers near or on the stage. This has been shown to be a most effective means of reducing exposure of those working either on the stage or at the front barrier close to the stage sound system and should be used wherever practicable. A further possibility, as an extension of the use of delay towers, is the use of a distributed sound system, which involves multiple speaker positions. Computer-controlled synchronisation of delay times ensures that sound reaching the listeners arrives simultaneously and can help avoid the need for unduly high sound levels near to the speakers.

452. Distributed sound systems increase the cost of staging a concert. An employer's statutory duty to protect the health and safety of workers and others who might be affected 'so far as is reasonably practicable' means that an assessment of the risk to health weighed against the cost of installing such equipment must be carried out. This will go some way to determine whether employers can satisfy their duty. The improvements in the sound quality that these new systems can produce and the additional audiences and audience satisfaction will need to be assessed as part of the cost benefits.

Job rotation

453. Sometimes it might be possible to control individual exposure through job rotation. Employees should rotate their jobs so that they minimise their exposure to loud sounds by moving to quieter areas on and off throughout the event, so reducing their total personal noise exposure.

454. This reduced exposure needs to be balanced against the increased number of workers who will be exposed to loud sound.

Ear Protection

455. If either of the above options fails to reduce the exposure to below the second or peak action levels, ear protection must be worn by employees and the self-employed. The employer should ensure so far as is practicable that employees are provided with adequate and suitable ear protectors.

456. In areas close to loudspeakers the selection of adequate ear protection (types providing adequate sound attenuation) is particularly important. The box below provides a guide to the 'assumed protection' (mean attenuation minus the standard deviation to BS 5108) which should be achieved by ear protectors worn by workers close to loudspeakers.

Assumed Protection Required for Areas Near Sound Systems

Frequency - Hz	63	125	250	500	1 kHz	2 kHz upwards
Assumed Protection (dB)	14	17	16	17	18	> 25

[Most suppliers publish the relevant attenuation data for each type of ear protector in a form that can be compared with the values given above]

457. As already noted musicians' hearing may also be affected by high sound levels and they too have a statutory duty to either reduce sound levels or to wear suitable ear protectors in certain circumstances.

458. Entrances to both the front barrier area and the delay tower loudspeakers should be marked with signs showing that they are areas where ear protectors are required. If there is any doubt about whether people who enter ear protection zones will already have ear protectors, ear plug dispensers should be provided at the entrances to the zones.

459. Management should ensure that ear plugs or other forms of ear protectors are worn where daily personal sound exposure exceeds the second action level.

Audience exposure to pop music

Background

460. Audiences too can suffer ill-health effects from exposure to high noise levels. However, the risk is reduced by the limited exposure time usually experienced at concerts.

Choice of Criteria

461. Background sound levels generated by an audience are often around 80-85 dB(A) and concert sound levels need to be at least 10 dB(A) above this level to be clearly audible. As the audience can extend 200 metres beyond the front of the stage, and in order for people furthest from the stage to be able to hear clearly, a clearly unacceptable sound level of about 120 dB(A) would be needed at 3 metres from the speakers. However, the use of supplementary speaker systems and delay towers around the venue can reduce this level.

462. Where free to move around, those attending concerts have a degree of choice about the level of exposure to sound. This is clearly not the case for those who are in fixed seating. As sound levels are likely to be at a maximum near the front barrier, this location should normally be used to measure audience exposure levels.

Audience exposure guidelines

(i) Over the duration of the event, the equivalent continuous sound pressure level should not exceed [104 dB(A)] in any public area.

(ii) This should be regarded as the maximum allowable and every effort should be made to set a lower limit.

(iii) The peak sound pressure in audience areas should not exceed 140dB re 20μPa.

(iv) Members of the audience should not be allowed within 3 metres of an operational speaker.

(v) If the event L_{Aeq} is likely to exceed [96dB(A)] promoters should ensure that information on the sound level and potential hearing damage risks is given to the audience. This could be done through warnings in the event programme or, if this is not possible, in advertising and publicity for the event.

L_{Aeq} levels referred to above relate to the period from the start of the concert (ie when the first act begins) to the end of the concert.

Environmental noise guidelines

463. An environmental noise guideline, the external guideline, needs to be established which will set a noise level for the local neighbourhood and which should not be exceeded at any time. To achieve the external guideline, it is necessary to control the sound levels within the venue. The guideline needs to take account of a number of factors, which can be broadly split into objective and subjective considerations.

Objective Factors

464. The location of the venue to nearby residential or other noise sensitive buildings is important. Buildings close to the premises are generally more likely to be affected than those located some distance from the venue. However, sound can be transmitted over large distances, widening the degree of disturbance.

465. Background noise levels form an essential element of the guideline. These need to be measured before the likely impact of a concert can be assessed. Background noise level should be measured in L_{A90} measured for any 15 minute period when no concert or rehearsal is going on but under similar conditions to those that will prevail during the concert (ie same day of week, same times of day and similar wind conditions). The event noise level (ENL) is the L_{Aeq} measured for any 15 minute period of the concert or rehearsal.

466. The frequency of events and intervals between them are also important. A number of concerts on consecutive nights is likely to give rise to a greater level of annoyance than the same number spread over a longer period.

467. Noise control procedures should also be considered. If it is clear that levels at the mixer position, where output levels are controlled, can be adjusted to meet the external guideline, a slightly higher level may be permitted. Sound levels will need to be more strictly applied if this is not the case.

Subjective Factors

468. Community reaction to a nearby pop concert depends very much on subjective factors, mainly individual sensitivity to noise.

469. Adverse public reaction may be reduced if there has been consultation with local residents, for example, by notifying neighbouring properties about the timing, erection and dismantling of the event and rehearsals. A contact point to handle complaints from local residents can play an important part in reducing problems.

Recommended environmental guidelines

470. Taking account of the above factors, the following guidelines should be met:

At concerts held on only one day per year at a particular venue:

(i) the event noise level (ENL) at 1m from the facade of a noise sensitive location should not exceed the background noise level by more than 25 dB(A);

(ii) no noise sensitive location should be exposed to an ENL above 75 dB(A). Between the hours of 2300-0900 the ENL at a noise sensitive location should not exceed the background noise level.

At concerts held on more than one day but not exceeding 12 concerts per year at a particular venue:

(i) the ENL at 1m from the facade of a noise sensitive location should not exceed the background noise level by more than 15 dB(A);

(ii) no noise sensitive location should be exposed to an ENL above 75 dB(A). Between the hours of 2300-0900 the ENL at a noise sensitive location should not exceed the background noise level.

At concerts held on more than 12 days at a particular venue:

(i) the ENL at 1m from the facade of a noise sensitive location should not exceed the background noise level L_{A90} by more than 5 dB(A);

(ii) sound from the venue should be inaudible at a noise sensitive location between 2300-0900 hours;

(iii) wherever possible, traffic management should be designed to minimise noise nuisance.

Control of loud sound at concerts

471. The following measures should be considered:

Prediction of sound propagation inside and outside a venue

472. An evaluation of sound propagation inside and outside the venue should be carried out in conjunction with the sound engineers to ensure an even distribution of sound within the venue, whilst minimising the sound extending unnecessarily to neighbouring areas. The most appropriate location for the stage (bearing in mind prevailing wind and nearby housing), speakers and delay systems should be considered in order to reduce sound levels generated at the stage while ensuring it remains audible at the perimeter.

Agreement of licence conditions with the licensing authority.

473. The organiser should agree on background noise levels with the licensing authority for the vicinity of a venue and on the particular criteria to be applied. Special local factors may need to be considered, eg where the site is near a hospital.

Dispersion Tests

474. During the rehearsal period, sound levels should be measured at the most sensitive locations around the venue eg at the front barrier and at the mixer position using a frequency spectrum source typical of the music likely to be played. Sound levels should then be set at the mixer position, the most direct point of sound control, to ensure that the environmental and noise exposure guidelines are met.

Monitoring and control during an event

475. The level maintained at the mixer position must ensure that both the environmental guideline and the maximum audience exposure level can be met. It should also ensure, where reasonably practicable, that workers exposure levels are not exceeded. The values of one minute L_{Aeq} should be logged alongside a cumulative indication of the event L_{Aeq}. The organiser and local authority inspectors should observe results as they are measured and inform the promoter and venue manager when control cannot be achieved.

476. Complaints must be investigated jointly and regular monitoring of environmental levels may be needed throughout the event. In addition, a technician may be needed near the front of the stage barrier during the event, to measure the maximum exposure level and peak sound level. The technician will need to be equipped with suitable ear protection. These measurements can also be achieved through the use of a suitable meter which records these levels throughout the event. The measurements can then be compared with the mixer sound levels to assist the control of future events.

GLOSSARY OF ACOUSTIC TERMS

L_{Aeq}: The Equivalent Continuous Sound Pressure Level:

The A-Weighted sound pressure level of a steady sound, that has, over a given time period, the same energy as the fluctuating sound under investigation.

L_{EPd}: The Daily personal noise exposure:

The total exposure to noise throughout the day, taking account of the L_{Aeq} noise levels in various areas and the time spent in them, but taking no account of any ear protectors.

ENL: The Event Noise Level:

The L_{Aeq} measured for any 15 minute period of the concert or rehearsal.

BNL: The Background Noise Level (L_{A90}):

The A weighted noise level exceeded for 90% of the measurement period.

NSR: The Noise Sensitive Receiver:

The measurement position recorded at a distance of 1 metre from a habitable premises.

L_{AP}: The Peak Sound Pressure Level:

The highest pressure reached by the sound wave during the measurement period.

FIRE PREVENTION AND FIRE-FIGHTING

477. It is vital that all premises used by the public are as safe as possible from fire and that employers and their staff know how to protect the public from injury or death if a fire should break out. To this end, the licensee should consult the licensing authority well in advance of the event to ensure that the proposals and fire precautions for the premises are adequate.

478. The need for early consultation is even more important where a temporary structure will be erected just prior to the event as it can prevent alterations at the last minute or even cancellation of the event. Where there is no requirement to obtain a licence it is nevertheless recommended that organisers should consult the fire authority for advice.

479. Recommended standards for means of escape and other fire precautions can be found in the Home Office/the Scottish Office publication 'Guide to Fire Precautions in Existing Places of Entertainment and Like Premises'.

Outdoor concerts

Site selection and access

480. When choosing a site, the following fire safety factors should be considered:-

a) access and egress for the public, emergency vehicles and equipment;

b) the proximity of surrounding buildings and vegetation and other fire risks in relation to the spread of fire;

c) the need for a telephone (to call the fire brigade);

d) availability of mains services;

e) the slope or evenness of the ground; and

f) the location of gas pipes (transmission mains).

g) electrical sub-stations, power lines, pylons, etc.

481. The outline plan of the site, showing all structures, referred to in paragraph 72 should also show the intended position of generator equipment, vehicles, etc. It should be kept up to date and be readily available for inspection on the site. The plan will need to be agreed by the licensing authority following consultation with the fire authority. It should not be altered without reference to the licensing authority. Early discussion should take place with the police regarding access, any proposed road changes and traffic control for supporting appliances.

482. The site should be arranged so as to allow for adequate means of access by fire-fighting appliances to within 50 metres of any structures. Access routes should be not less than 4 metres wide, should have no overhead structure or cable less than 4.5 metres above the ground, and should be capable of taking the weight (about 12.5 tonnes) of fire fighting appliances in all weathers. Emergency vehicle routes within the site should be clearly indicated and kept clear of obstruction at all times.

483. Access to hydrants and other water supplies should not be obstructed or obscured.

Spacing between portacabins, caravans and other structures

484. The spacing between portacabins, caravans, catering concessions and other structures should be at least 6 metres. For large tents and marquees this distance should be increased to 12 metres so that a fire starting in one such structure cannot spread to adjacent structures.

Ignition sources

485. The main sources of fire ignition in an indoor venue are overloaded electrical circuits and the presence of combustible material, which can be readily set alight by cigarettes or matches. Many theatres, concert halls, etc do not allow smoking and where this is the case, stewards will need to ensure that the policy is enforced. Temporary storage of any combustible materials should be in such positions as may be approved by the licensing authority.

486. Combustible material can easily accumulate at an outdoor concert, eg under temporary stands, or in overfilled litter bins. To minimise this fire risk, organisers need to ensure that staff are employed to undertake checks and to collect rubbish. Members of the audience may accumulate material for bonfires and organisers should consider ways of reducing the potential for this to occur.

487. Wherever reasonably practicable, non-combustible materials should be used in any construction. Where this is not possible, flame resistant materials should be used, for example where timber has to be used it may be necessary to sheath the timber with plaster-board or some other non-combustible material to prevent it from catching alight. Appropriate fire extinguishers should be conveniently placed in order that any fire can be quickly dealt with.

Heating appliances

488. All heating appliances should be suitably guarded and fixed in position in such a manner so as to prevent unauthorised persons having access to the controls or being able to approach sufficiently close to the appliance to endanger themselves.

489. Every heating appliance used in both premises and temporary structures should be situated at a safe distance from any combustible materials or substances. In deciding the safe distance regard should be given to the type of heater and the ease of ignitability of the nearby materials or substances.

490. Care should be taken to ensure that radiant heaters, particularly those fitted with reflectors, are not directed towards combustible materials and that, wherever possible, they are mounted at a high level above head height, usually at least 2.5m above floor level.

Note: It is not possible to give definitive advice on the safe distance necessary between heater and combustible material due to the many variable factors involved. Generally any combustible material should not have its temperature raised significantly above the ambient temperature for the area by the effects of direct heating by the appliance.

491. No oil-fired heaters, other than those forming part of the boiler installations, should be used in the premises/temporary structures.

492. No portable liquefied petroleum gas (LPG) heater should be in the premises when members of the public are present. Containers of LPG should be protected against unauthorised interference and accidental leakage. LPG cylinders, both full and empty, should be kept in safe positions in the open air away from other flammable materials, or where this is not reasonably practicable because of exceptional circumstances, in an adequately ventilated storeroom constructed in accordance with HSE Guidance Note CS 4 - 'The keeping of LPG in cylinders and similar containers' (HM Stationery Office, ISBN 0 11 883539 4). The storeroom should not be used for any purpose other than the storage of LPG cylinders. LPG cylinders in use should be sited outside the structure and with their valves readily accessible in case of an emergency.

Access and egress

493. Before the public are admitted to any concert, all exits should be checked to ensure that they are unlocked and available for use.

494. A record should be made in a logbook to confirm that exits are in a satisfactory condition. Details of what should be recorded are in Chapter 1.5 of the Home Office's 'Guide to Fire Precautions in Existing Places of Entertainment and Like Premises'.

495. The whole time that the structure(s) are open to the public, all access and egress points should be kept free from obstruction and work activities which might prevent them from being immediately available in the event of a fire.

496. All exit routes should be kept free of obstruction and be capable of being safely and effectively used at all material times.

497. Fire doors should not be wedged or propped open.

Exit and directional signs

498. People will usually attempt to leave premises by the same way that they entered. As these entrances in places of entertainment will of necessity be restricted it follows that the exit facilities provided for the premises will

not be fully utilised. For this reason, all available exits should be clearly indicated so that the public are aware that there are ways to leave the building other than by the doors which they used to gain admission. In addition, the provision of well sign-posted exits in full view of the audience will give a feeling of security in an emergency situation.

499. Fire safety signs, notices and graphic symbols should conform with BS 5499: Part 1, and with BS 5499: Part 3 for internally illuminated exit signs. Self-luminous fire safety signs should also comply with the requirements of BS 5499: Part 2. Existing signs and notices which do not meet the British Standard need not be replaced immediately if they are effectively fulfilling their purpose. They should however be examined and replaced if they are found to be inadequate.

500. Self-luminous fire safety signs will not generally be allowed where the viewing distance exceeds 24m.

501. Maintained internally illuminated exit signs will be required where the lighting may be dimmed or extinguished.

502. Exit signs should be illuminated whenever the public are present.

503. A notice bearing the word 'EXIT' in plain block lettering not less than 125mm high should be placed over any door or opening leading from the place of assembly into an exit. The notice should be positioned, wherever possible, between 2m and 2.5m above the floor. No other notice should be incorporated in, or form part of, an 'EXIT' notice other than a directional arrow.

504. Any exit which is not a normal route of travel from the premises should be indicated by a notice bearing the words 'Fire Exit' in conspicuous lettering of appropriate size. The notice should, wherever possible, be displayed immediately above the exit opening. Where this is not possible a position should be chosen where the notice can be seen and it is least likely to be obstructed.

505. Where an exit cannot be seen or where persons escaping from the premises may be in doubt as to the location of the exit, 'Fire Exit' signs, to include a directional arrow, should be provided at suitable points along an escape route. Such notices should be fixed in conspicuous positions and wherever possible should be positioned betwen 2m and 2.5m above the floor level.

Notices on doors, shutters and gates

506. All fire notices should be in conspicuous lettering and of appropriate size.

507. A notice with the words 'Push bar to open' should be permanently displayed immediately above the push-bar on all doors fitted with a panic bolt or panic latch.

508. A notice with the words 'Fire door - keep shut' should be permanently displayed at about eye level on both faces of all fire doors except those to cupboards. Fire doors which are normally open but which close automatically on the operation of fire detectors should bear the words 'Automatic fire door - keep clear'.

509. A notice with the words 'Fire door - keep locked shut' should be permanently displayed on the outside face of all fire doors not required to be self-closing, eg cupboards.

510. A notice with the words 'Fire escape - keep clear' should be permanently displayed at about eye level on the external face of all doors which are provided solely as a means of escape in case of fire and which, because they are not normally used, are liable to be obstructed.

Mirrors

511. Any mirrors situated on escape routes should be so sited that persons escaping from fire will not be confused by any reflected image of the route they are using, or be misled as to the direction they should take to reach fire exits.

Stewards' duties and training

1. Competent stewards need to be on duty during the whole time that the public are on the premises. They should have been specifically instructed as to their responsibilities in the event of fire or other emergency. The particular needs of disabled persons must be taken into account (see section on Stewards). A steward or stewards should carry out a regular fire patrol to check for possible fire hazards. Their prime responsibility is to give warning and then evacuate any people at risk, to alert the emergency services and to attack the fire where this can be done without risk to their own health and safety.

2. All staff should be competent and trained in the following:-

   a) the action to be taken upon discovering a fire;

   b) the action to be taken upon hearing the fire alarm;

   c) raising the alarm, including the location of the alarm call points and alarm indicator panels;

   d) the correct method of calling in the fire brigade and other emergency services;

   e) the location and use of fire-fighting equipment;

   f) knowledge of all escape routes and the method of operation of any special escape door fastenings;

   g) where appropriate, appreciation of the importance of fire doors and the need to close all doors at the time of a fire and on hearing the fire alarm;

   h) the operation of all escape doors not in regular use, to ensure that they function satisfactorily; and

   i) evacuation of the building/structure to an assembly point at a place of safety (this will include reassuring the public).

512. Where staff are transferred to another part of the premises for operational reasons, they need to be aware of the means of escape and fire procedures of the new work area (including any additional responsibilities).

513. A record of staff training, to include the name of the staff attending each practice drill, and details of the training and instruction should be kept showing:-

a) date of the instruction or exercise;

b) duration

c) name of person giving instruction;

d) names of persons receiving instruction;

e) context and nature of instruction, training and where appropriate, drill.

Calling the Fire Brigade

514. The fire brigade should be called immediately to every outbreak of fire or if a fire is suspected. Instructions on the location of the nearest telephone and the method of calling the fire brigade should be prominently displayed. If a telephone is not readily available, consideration should be given to the provisions of portable telephone facilities.

Means for giving warning in the event of fire

515. In any building or structure used for a pop concert, there should be a means for giving warning in case of fire. A fire alarm system should comply with the recommendations for Type M of British Standard fire alarms systems given in the 'Guide to Fire Precautions in Existing Places of Entertainment and Like Premises'.

Fire-fighting equipment

516. During preliminary planning of an event, the fire authority will decide whether additional means for fighting fire should be provided or whether existing equipment is suitable. Portable equipment should be located as agreed with the fire authority and be readily available for use. The equipment should be tested regularly and tests should be recorded in the logbook referred to in paragraph 494.

517. Premises licensed to accommodate less than 500 persons should be provided with 1 portable water-type extinguisher (rating 13A) for every 200m^2 of floor area or part thereof with not less than 2 such extinguishers on any floor (see also paragraph 10.3).

518. Manual fire-fighting equipment should also be provided for special risks in accordance with the following scale:

(a) Stage exceeding 56m^2:

hydraulic hose reels or 2 water-type extinguishers (rating 13A on each), on each side of the stage, and 1 light duty fire blanket;

(b) Stage not exceeding 56m^2:

1 water-type extinguisher (rating 13A), on each side of the stage, and 1 light duty fire blanket;

(c) Dressing rooms:

in every block of 4 dressing rooms a minimum of 1 water-type extinguisher (rating 13A), and 1 light duty fire blanket;

(d) Scenery store, stage basement, property store, bandroom:

1 water-type extinguisher (rating 13A) in each risk area, or an appropriate extinguisher where water is unsuitable for the fire risk presented;

(e) Electrical intake rooms, stage switchboards and battery rooms:

1 carbon dioxide extinguisher or 1 dry powder extinguisher or 1 halon extinguisher (minimum rating 21B);

(f) Boiler rooms:

(i) solid fule fired - 1 water-type extinguisher (rating 13A);

(ii) oil fired - 1 dry powder or foam extinguisher (rating 34B).

Note: A water-type extinguisher may be replaced by any of the types of extinguishers described in paragraph xxx.

(g) Stalls:

At least 1 fire extinguisher of approved pattern, capacity and type for the risk should be provided on each stall where stalls are provided for the sale of refreshments, etc.

519. The date of the annual inspection and any refilling after discharge should be clearly marked on exitinguishers or on a stout tab securely attached to them.

General fire precautions

520. Fire instruction notices should be displayed in all staff areas. They should be drawn up in consultation with the fire authority.

521. Where gas and electrical services are provided, the emergency services should be advised how to isolate these supplies and suitable notices should be provided.

Storage Under Stage

522. The space underneath the stage should not be used for the storage of flammable materials. Where the stage is of softwood construction the underside and supports should be rendered fire resisting with fire resisting paint or solution.

No Smoking On Stage

523. Except in connection with a performance, smoking should not be allowed on any part of the stage. 'No Smoking' notices should be conspicuously displayed in the wings behind the stage.

Pyrotechnics and special effects

524. Pyrotechnics and materials used for special effects, including flammable liquids and gases should not be used or stored on the premises, unless previously approved by the licensing authority.

Real Flame

525. Real flame should not be used without prior consent of the licensing authority.

Vehicles

526. Where large indoor halls allow the entry of vehicles, their arrival and departure should be controlled to ensure that petrol driven vehicles do not enter or remain in the hall while the public are on the premises. Petrol driven vehicles should not be permitted to park adjacent to any temporary structures.

527. Diesel driven vehicles are not as great a fire risk as petrol driven vehicles but they do emit noxious fumes. Subject to the site arrangements, the presence of such vehicles in the premises may be permitted while the public are present, provided that their siting is agreed and that the vehicles do not obstruct escape routes, gangways, exits and any fire fighting equipment.

[GLOSSARY OF TYPES OF FIRE EXTINGUISHERS]

FIRST AID PROVISION

528. The number of people requiring first aid treatment at concerts varies considerably. Members of a quiet, well-behaved, mature audience of a few hundred may require no more than sticking plasters, assistance with contact lenses or with headaches. Members of a large excitable young audience may suffer dehydration, hyperventilation, bruising, crushing injuries and unconsciousness. It must always be borne in mind that people with asthma, heart problems, diabetes, etc. may attend concerts and their condition may be exacerbated or, in extreme cases, their lives may be at risk. It is essential that adequate provision for first aid is made at all concerts.

529. The organiser of large events should appoint a suitably qualified and competent medical officer, such as a consultant in Accident and Emergency or a St John Ambulance senior officer to advise on the first aid provisions. The recommendations should be based upon the information given by the organiser of the event relating to venue, expected attendance numbers, the anticipated nature of the audience, including its age range and male and female ratio, and any other relevant information which may mean that increased first aid requirements are needed. Previous experience of the artistes' concerts should be taken into account. At such large events the organiser should consider appointing somebody to take overall control and co-ordination of first-aid provision.

530. The ambulance service should be notified of the time, location and other relevant details of the event at least four weeks beforehand.

531. The organiser of each event should consider if there is a possibility of public disorder or other major audience problems. In such cases, the level of first aid provision will need to be considerably greater than is normally the case. The following tables provide recommended guidelines for events where disorder or other problems are possible (Category A) and other events (Category B). These recommendations should be regarded as minimum figures for each type of event.

Category A

532. For audiences of up to 10,000, first-aid staff should be provided to the ratio of 1:250 attending. Thereafter, the number of first-aiders should be calculated on the basis of the ratios set out in the table below. A selection of audience sizes have been included to illustrate this.

	First 10,000 or part	**Second 10,000 or part**	**Third 10,000 or part**	**Fourth 10,000 or part**	**Total First Aid staff**	**First Aid posts**	**Ambulances**
Sample Audience Sizes	**Ratio 1:250**	**Ratio 1:500**	**Ratio 1:750**	**Ratio 1:1000**			
1,000	4	-	-	-	4	2	3
5,000	20	-	-	-	20	2	3
10,000	40	-	-	-	40	2	3
20,000	40	20	-	-	60	3	4
30,000	40	20	15 (rounded)	-	75	4	5
40,000	40	20	15 (rounded)	10	85	4	6
Above 40,000					100	5	6

533. For example, a concert of 30,000 would be assessed on the basis of one first-aider for each 250 attending for the first 10,000 (40), one first-aider for each 500 for the second 10,000 (20), and one first-aider for each 750 for the third 10,000 (15, rounded up). 75 first-aid staff would be needed, therefore.

534. It is suggested that for concerts in Category A which have more than 40,000 attending, a minimum of 100 first-aid staff will be required.

535. The above Table also indicates the minimum number of first-aid posts and ambulances which would be required for Category A concerts.

536. It should be borne in mind that many of the patients who require attention in Category A concerts are in the under-16 age group and, while first aid is not always required, there may be a need to treat various forms of hysteria which often requires one to one attention. This can occur at indoors and outdoors concerts.

Category B

537. Appropriate levels of cover are, broadly, half those indicated for Category A; the following table illustrates the cumulative figure appropriate to a selection of audience sizes:-

Audience Size	First-Aid Staff	First-Aid Posts	Ambulances
10,000	20	1	1
20,000	30	2	2
30,000	35	3	2
40,000	40	3	3
Over 40,000	50	4	4

First Aid Posts

538. First aid posts should be provided by arrangement with the St. John's Ambulance Brigade or other appropriate first aid organisation. For outdoor events, these should be marquees, tents or approved mobile units. For indoor events, the first aid post(s) should be provided in or adjacent to the main arena and should be readily accessible for ambulance staff.

539. At large events, a first aid post should be provided adjacent to the stage area. There should be unrestricted access to this from the pit area. Agreement should be reached on the respective roles of paramedics and the pit security team. For audiences in excess of 30,000, a large marquee (outdoor events) or large room (indoor events) should be provided for use as a casualty clearing station.

540. Each first aid post should be adequately heated, lit and ventilated and should be maintained in a clean and hygienic condition, free from dust. It should contain adequate blankets, pillows, stretchers, couches, buckets, bowls, trolleys and screens. It should also have a telephone connected to an external line; an internal telephone or radio telephone with direct contact to the

licensee; hot and cold water supply or, if this is not possible in the case of an outdoor event, sterile water or sterile normal saline; and a supply of drinking water over a sink or wash hand basin. A WC should be reasonably accessible and in close proximity.

541. Each first aid post should be staffed by a sufficient number of competent first aid personnel,wearing distinctive dress, some of whom should be available to offer assistance within areas occupied by spectators. At outdoor events, a proportion of the first-aiders should be strategically positioned around the site and, where possible, should be in radio contact with a fully equipped first aid point.

542. At concerts where the expected audience is over 5,000, at least one qualified competent medical practitioner, trained in cardiac pulmonary resuscitation, and at least two competent nurses should be present for each 10,000 attending or part thereof.

543. The organiser of the event should maintain a record in which details of all people receiving first aid treatment can be recorded. This record should be kept readily available for inspection by the relevant authorities.

544. Each first aid point should be clearly identified by signposting and all stewards should be aware of its position.

545. Adequate telephone and radio contact should be set up between the organiser, or the event safety officer, and the main first aid centre/control room.

First Aid for employees

546. Under the Health and Safety (First Aid) Regulations 1981, employers are responsible for ensuring that first aid facilities are provided for their employees. First aid staff appointed to provide these facilities must have the necessary competence and training to meet the requirements of the Regulations. The organiser of the concert may find it helpful to have a written agreement between the various employers involved in the event which makes provision for one first aid service to meet all their needs.

INFORMATION SERVICES

Introduction

547. The organisers of any concert will need to provide information to those attending. This can play an important part in ensuring that the concert runs smoothly and will play a vital part in dealing with any emergency.

548. The content of the information and the means of delivering it will vary according to the circumstances of the concert. Any messages must be clear and concise.

549. Public address announcements are an important method of conveying information and these are covered in the section on crowd management.

550. Information which may be needed falls broadly into two categories:-

(a) information on concert-related activities ie events, workshops, displays, entertainment, location of services, sanitary conveniences, telephone, etc;

(b) information on what is available in local area, ie doctors, chemists, hospitals, transport, dentists, banks, police station, social services, accommodation, shops, etc.

551. While large, outdoor events will require most of this information to be provided, smaller, indoor concert information needs will be more limited. Provision will need to be tailored to suit the event. The following are examples of ways in which the information can be provided, mainly for larger events:-

(a) Site plans

Site plans can be provided. These should be large, clear, waterproof and conspicuously sited and should show:-

Sanitary conveniences
Stage
Camping area

- Exits and entrances
- Car parks
- Main roads
- First aid points
- Emergency Services
- Welfare points
- Police point
- Catering facilities
- Lost people's meeting point
- Public telephones
- Children's play area
- Lost property

(b) Programmes

When available, these should include the times and locations of events, a site plan and local information as well as details of what may or may not be admitted to the site and health warnings about noise levels, if appropriate.

(c) An information point

An information point can provide people with general information and advice. This should be sited in a 'quiet' area and have easy access.

(d) Signposting

All services etc should be clearly and conspicuously signposted from all areas.

(e) Ticket Information

Information on tickets should be unambiguous, clear and accurate. Retained stubs should contain information to guide the holder once inside the site.

552. It is recommended that the following kinds of information are included on the admission ticket for health and safety reasons:

1. Restrictions on bottles, cans, etc being brought into the arena;

2. A site plan;

3. A warning that prolonged exposure to loud music can damage your health;

4. Restrictions on the admittance of children under the age of 5;

Lost property

553. Arrangements should be made for the secure storage and retrieval of lost property.

Lost persons

554. Provision should be made at all events, particularly those where children are attending, for the assistance of lost persons. At large outdoor events, a children's area should be provided. This should be in a quiet part of the site and be provided with appropriate amusements and supervision.

Drug counselling and befriending

555. Large concerts may require the expert services of organisations such as the Samaritans and drug counsellors. Contact should be made with Festival Welfare Services for further details.

FOOD AND REFRESHMENTS

556. All sales, delivery and storage of food should comply with the Food Hygiene (Amendment) Regs 1990 and the Food Hygiene (Markets, Stalls and Delivery Vehicles) Regs 1966 as appropriate, and details should be agreed in advance with the Environmental Health Dept. A full list of concessions should be available prior to the event.

557. For licensed events, the licensee has direct responsibility to ensure safe methods of food delivery, storage, preparation and service and should therefore ensure that all traders fully comply with the requirements of the appropriate Regulations. The supervision and control of standards may be best achieved if catering arrangements are made by one organisation.

558. Unless the concert is a very short event, a selection of food should be made available. Food and drink for children may also be required. The needs of those who require special diets, such as diabetics, should be borne in mind.

559. No drink or food should be sold or distributed in glass bottles or cans to any member of the audience.

560. No mobile vehicle used for dispensing food and drinks etc, should be permitted to cross concourses or exitways whilst members of the public are on the premises and such vehicles and any stall, kiosk, etc should be positioned well away from the stage exit and exit routes.

Sale of alcohol

561. If alcohol is to be sold at the event a licence may be needed from the licensing magistrates. This is a separate licence from the licence which the local authority may issue for the event. The local authority's licence may also stipulate conditions in relation to the sale of alcohol, eg bar opening hours, types of container to be used, etc.

Public telephones

562. It is recommended that public telephones are available on site, particularly if pass outs are not available.

"Crash" marquee

563. Large outdoor events often have campsites close to the concert arena. In some cases, people arrive before the event without a tent or sleeping bag. Consideration should therefore be given to the provision of a marquee, a 'crash' marquee, where people can sleep and stay dry.

DRINKING WATER

564. The provision of drinking water is of particular importance at concerts where the audience may be assembled in hot, cramped conditions. In such circumstances, dehydration can be a serious problem, often leading to fainting, collapse and potential trampling.

565. An adequate supply of clean, wholesome drinking water should be readily available at all concerts. A sufficient number of outlets should be distributed throughout the site. At outdoor premises, it is recommended that one outlet should be provided for every 5000 persons or part thereof attending.

566. At all venues, a supply of drinking water should be available at the first-aid points and immediately adjacent to sanitary conveniences. A separate supply of water should also be available for each food vending point.

567. The supply of drinking water should be accessible to all those attending. At outdoor events, the need to carry water over long distances should be avoided. If there is a camp site, water for cooking should be made available adjoining the concert site. At outdoor events, each tap should be self-closing and the ground adjacent to and surrounding the tap should be absorbent and well drained to prevent waterlogging.

568. Water should be provided through a mains supply, but if this is not possible, barrels and bowsers should be used. All connections and services should be checked and maintained.

569. For outdoor events, where water needs to be stored, the following quantity of drinking water should be regarded as the minimum that will need to be supplied. These figures take account of wastage:

5 litres per person per day
20 litres per person per day at concerts which have camp sites.

570. In addition to the above, a wholesome and plentiful supply of drinking water should be provided in the pit area, together with an adequate supply of paper/plastic cups (a minimum of 3,000 should be provided at large events. A minimum of two water points should be provided in the pit area and these should not be within reach of the public. If storage containers are used, these should be clean and provided in sufficient numbers to allow rapid access.

SANITARY ACCOMMODATION

Public

571. The organisers of pop concerts must ensure that adequate sanitary conveniences are provided. If this is not the case, or if the conveniences are badly designed or poorly distributed at the site, this can give rise to insanitary conditions and health risks.

572. In assessing the requirements for an event, the organiser should consider location, access, construction and signs as well as the number of facilities that are required.

573. To minimise crowding and queuing problems, sanitary conveniences should, where possible, be located at different points around the arena and should not be concentrated within a small area at one location. They should not be situated in the vicinity of food stands. In deciding on the location, access for servicing and emptying should be considered.

574. Sanitary conveniences should ideally be connected to the mains soil drainage. However, if this restricts the required distribution, non-mains conveniences should be used.

575. Sanitary conveniences should be kept clean, to prevent risks of infection. They should also be structurally sound, protected from inclement weather and constructed in such a way that risks to members of the public are minimised.

576. Sanitary conveniences should be well lit at night (50 lux (lx) minimum).

577. An adequate supply of suitable paper should be provided for use in sanitary conveniences in a means that prevents its removal.

578. Sanitary conveniences should be readily accessible and clearly signposted from all parts of the premises.

Sanitary conveniences requirements

579. In assessing the convenience requirements, an estimate should be made of audience size and the anticipated male/female ratio. When there is insufficient information to assess this ratio, a 60:40 male/female split should be assumed.

580. For a concert of 8 hours or more, the following sanitary accommodation should be provided:

Female conveniences

1 WC per 100 females or part thereof.

Male conveniences

1 WC for 100 males or part thereof
2 WCs for 101-500 males
3 WCs for 501-1000 males

Thereafter an addition 1 WC for every additional 500 or part thereof

1.5m of urinal accommodation per 500 males

581. If unisex accommodation is provided it may allow greater flexibility and may permit reduction in the numbers of conveniences. However, increased management supervision will be needed.

The start of the first act should be regarded as the opening of the concert. The above figures can be reduced for shorter concerts, thus:

Duration of Concert	Percentage of above standard
More than 8 hours	100%
6 hours but less than 8 hours	80%
4 hours but less than 6 hours	75%
Less than 4 hours	70%

582. Suitable and sufficient attendants should be provided for both male and female sanitary accommodation to prevent misuse and to carry out cleaning and maintenance.

583. Where temporary sanitary accommodation is required, this should be of the self- contained portable flushtype and suitable arrangements should be made for emptying the tanks of these units on a regular basis to prevent overflowing. For a concert at a permanent site which has an audience consisting mainly of women, most of the toilets for men should, where practicable, be made available temporarily to women. This accommodation should be clearly labelled as such.

Disabled

584. Appropriate sanitary accommodation should be provided for those who attend the concert in wheelchairs.

585. A minimum of one unisex water closet should be provided for venues which have a capacity of up to 2000. The water closet(s) and associated fitments including wash hand basis should be sited conveniently for any area reserved for wheelchairs and should be designed to comply with the provisions of the current BS 5810 1979 Access for the Disabled to Building - General Recommendations. The provision of additional water closets of this nature should relate to the expected numbers of those attending in wheelchairs.

Wash-hand basins

586. Wash-hand basins should be provided in the following ratio:

1 per 20 WCs
1 per 15 m urinal

Each WHB should be provided with bacteriocidal soap where hot water is not provided.

Sanitary towels

587. Suitable provision will be needed for disposing of used sanitary towels. These facilities will be needed adjacent to any female sanitary conveniences. Provision of fresh supplies of sanitary towels will also need to be considered and major suppliers may be prepared to provide disposal units as well as the means of disposing of their contents. They may also be prepared to provide vending machines which provide a selection of sanitary towels and tampons.

Workers

588. There is a statutory requirement on employers to provide suitable sanitary conveniences for workers - see the Sanitary Conveniences Regulations 1964.

589. These sanitary conveniences should comply with the conditions in preceding paragraphs.

590. The number and location of these facilities will depend on a number of factors, e.g. nature of site or venue, length of concert etc. The following are suggested guidelines:-

Closet Accommodation. Number of persons of each sex employed at any one time on site	**No. of Waterclosets**
1-15	1
16-30	2
31-50	3
51-75	4
76-100	5
in excess of 100	5+ one for every 25 persons by which the number exceeds 100

591. Where urinal accommodation is provided, the following guidelines may be appropriate:-

Number of males on premises at any one time	**No of WCs**	**Unit of urinal accomm.**
1 - 15	1	-
16 - 20	1	1
21 - 30	2	1
31 - 45	2	2
46 - 60	3	2
61 - 75	3	3
76 - 90	4	3
91 -100	4	4
in excess of 100	4	4

with the addition of 1 sanitary appliance (either a WC or urinal) for every 25 persons in excess of 100 or part thereof.

Outdoor events:

Location

592. Sanitary accommodation for workers should be sited adjacent to work areas and in particular behind the stage, and adjacent to the mixing tower.

WASTE DISPOSAL

Introduction

593. The most common forms of waste at concerts are food and drink containers, plastic sheeting and paper. Refuse can cause health and safety problems: it can attract pests, it can form tripping hazards and flammable material is a fire risk. Problems are likely to be more acute at outdoor events.

594. A sufficient number of readily accessible lidded receptacles for refuse should be provided at outdoor premises and, arrangements should be made for the regular collection of refuse during the performance and for its removal to an approved and attended position.

595. There are three main types of waste bins. All have advantages and disadvantages and organisers of events will need to assess these and make suitable arrangements in the light of each particular event. At certain concerts, it is likely that receptacles will be misused and in these circumstances it may not be appropriate to provide them.

Types of Waste Bins

596. All waste bins must be strategically placed and easy to reach. A majority should therefore be sited close to the area which is expected to have the highest density of those attending. This can cause problems as the waste bins take up space and access for emptying may be difficult. Perimeter siting is easier but less accessible. Waste bins are especially needed around the conveniences and the camp site.

(a) Skips hold a large quantity of refuse in one area which is easier to dispose of, but have the disadvantage that generally those attending have to take their litter further to deposit it. In addition, skips full of refuse can be fire hazards.

(b) Smaller receptacles can be distributed around the site, and are therefore more accessible, but have the disadvantage of being time-consuming to empty and can fall into disrepair.

(c) Plastic or paper sacks are cheap to provide and can be distributed widely but are easily damaged.

597. At outdoor events, some of the refuse will be blown around the site or deposited indiscriminately. Arrangements should be made to clear this up both during and after the concert.

Clinical Waste

598. Clinical waste for first-aid treatment areas will need to be put into suitable containers and arrangements made for its adequate and proper disposal. Where there are "sharps" such as hyperdermic syringes and needles, special containers for their disposal should be provided.

Handling of waste

599. Workers handling waste must be provided with suitable protective equipment particularly gloves. Great care should be exercised in handling discarded hypodermic needles and syringes and special arrangements should be made when clearing around sanitary accommodation to avoid the need to handle these items.

E. IMPLEMENTATION

600. The guidance above has already looked at the problems associated with planning a pop concert or similar event; the preparation of the site or venue; the construction of the stage and allied infrastructure; and the arrangements for first aid and welfare.

Performance

601. It is advisable at the beginning of any performance for a statement to be made about safety, preferably by somebody with whom the audience can identify and who is respected. Disc jockeys and the performers themselves have successfully undertaken this. The message which needs to be put across is that the event has been designed with safety in mind but the audience must play their part in ensuring that it finishes in safety. Issues such as smoking, drinking of alcohol, throwing objects are issues which may well need to be addressed. Similarly the audience should be asked to look after their fellows in the event that they are taken ill or overcome through heat and exhaustion.

602. The conduct of the artistes during the course of the performance can have a marked effect on the audience. Performers may need to be advised about the dangers associated with throwing items of clothing and equipment into the audience. A particular danger is the habit of some drummers to throw their drum sticks into the audience at the end of a performance. This can and has resulted in serious eye injuries. During the course of the event the performers themselves also need to watch the behaviour of the crowd, particularly where crowd sway is involved as this can lead to serious crushing injuries for members of the audience.

603. Slam dancing and other similar activities should be firmly discouraged.

F. MONITORING THE SYSTEM

Prior to the Performance

604. Inspection of the infrastructure and management systems prior to the event is very important, particularly where an outdoor event is being mounted. The positioning of the stage, delay towers, lighting towers etc. should be checked against the drawings and plans and structural engineers should be on hand to check the engineering integrity.

605. Checks should also be made on cabling to ensure that it cannot be tampered with by unauthorised personnel and that the sensitive areas of the infrastructure are properly fenced off to ensure no unauthorised access. The storage of bottled gas supplies should also be checked to ensure that they conform with the advice detailed in the guidance above.

606. For large outdoor concerts, a check should be carried out on the night before the concert of lighting in all relevant areas, including exits, car parks, etc.

607. These checks need to be carried out well in advance of the admission of the public to the site because it may become apparent, for example, that locations of temporary structures need to be changed, e.g. first aid tent being positioned close to a car park.

Monitoring During the Event

608. During the event all aspects of the infrastructure and particularly audience behaviour need to be carefully monitored.

Complaints Procedure

609. At large events, a procedure should be established which enables the organiser, venue manager, local authority inspectors and other key personnel to deal with a complaint. If sound levels outside the venue are found to exceed the level set in the licence conditions, corrective action will need to be taken. A hot-line telephone number available during the concert should be considered.

Crowd Behaviour

610. At many events, closed circuit televisions are used to monitor crowd behaviour so that if, for example, crowd sway builds up within the audience, the employer and local authority inspectors can assess whether this presents a risk to members of the audience. If this is the case steps will need to be taken to safeguard the health and safety of the audience. This could include a warning to members of the group that they should stop playing or that they should make an announcement between numbers asking the crowd to calm down.

611. A log should be maintained of monitoring checks that are made as well as points that crop up during the performance which relate to its safe management and organisation. The use of a tape recorder may be advisable.

Communications on Day of the Event

612. Prior to the start of the event a meeting between the concert promoter, licensee, pop group managers and other employers on site to brief about final arrangements and resolve queries should be held. It is essential that any last minute changes, e.g. in relation to car parking, direction of cars on site or off site, admission gates are implemented well in advance of a crowd's arrival. At this briefing meeting it is also essential that members of the police, emergency services, first aid and local authority inspectors are involved so that any last minute points of concern which they may have are raised and clearly understood by all parties. As indicated already, the manager appointed in overall charge of the event should maintain contact so that any problems which occur can be dealt with within the overall plan for the management of the concert. It is vital that problems should not be resolved in isolation; they must be considered in the context of the whole event.

613. It might occasionally be necessary to arrange progress meetings during the event, particularly where it is being conducted over a number of days so that experience of the first day can be reviewed and evaluated and any practical lessons which have been learned can be applied to subsequent days.

De-briefing After Event

614. It is essential that following the event the participants at the planning meetings should be called together to review and to evaluate what took place during the event so that lessons can be learned and be applied to future events.

615. A report should be prepared indicating the noise levels agreed with the local authority and the results obtained during the event at the mixer position, the front barrier and the external measurement points. This should highlight any complaints, the action taken and make recommendations for future controls at the venue.

ACCIDENT REPORTING

616. All accidents should be reported to the ESO who should record them in a site accident book. Certain accidents must be reported under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1985 on Form F2508 to the relevant enforcing authority. The employer of an injured worker has a statutory duty to make the report. In the case of a self-employed worker, either the self-employed person themselves, or somebody acting on their behalf, should make the report. If a member of the public is injured, the person with overall control of the premises, whether the licensee or any other person, should make the report. The leaflet HSE 11(Rev) gives further information on reporting responsibilities and the injuries which must be reported.

APPENDIX 1

Legislation

Pop concerts, like other work activities, are subject to various laws. There are two primary Acts of Parliament which regulate health, safety and welfare. These are the Health and Safety at Work etc. Act 1974 (HSW Act) and the relevant public entertainment licensing law for the area in which the concert is to be held; in many cases this will be the Local Government (Miscellaneous Provisions) Act 1982.

The Health & Safety at Work etc. Act 1974 (HSW Act)

The HSW Act aims to secure the health, safety and welfare of people at work and to protect people other than those at work against risks to health and safety arising out of work activities.

To do this, it imposes duties on everyone concerned with work activities, ranging from employers, self-employed and employees, to manufacturers, designers, suppliers and importers of materials for use at work, people in control of premises and members of the public.

The duties are expressed in general terms, so that they apply to all types of work activity and situations. In some cases, the general duties have been supplemented by specific requirements laid down in Regulations made under the Act.

Section 2 of the Act is concerned with the duties of employers to their employees. The general duty is to ensure, so far as is reasonably practicable, the health, safety and welfare at work of all employees. Some of the most important areas covered by this general duty are specified. This section also requires every employer who employs 5 or more workers to prepare a written statement of safety policy setting out the organisation and arrangements in force for carrying out that policy.

The Section also requires an employer to ensure, so far as is reasonably practicable, that workers are trained to carry out their work without risk to their health and safety.

Section 3 places a duty on employers and the self-employed to safeguard those not in their employment, the public for example, who could be affected by the conduct of their undertaking.

Section 4 places a duty on those who have control, to any extent, of non-domestic premises (or of plant etc. on such premises) to ensure, so far as is reasonably practicable the premises (or plant, etc) are safe and without risks to health of those who work there (other than their own employees).

Section 6 sets out the legal duties of designers, manufacturers, importers and suppliers to produce or provide articles and substances which are, so far as reasonably practicable, safe and without risk to health when used at work.

Section 7 requires employees to take reasonable care for the health and safety of themselves and others.

Application of the HSW Act to pop concerts

Section 2 applies to all organisations with employees on the pop concert site including contractors, engineers, construction companies.

Section 3. Everyone involved in the staging of a pop concert will need to consider their duties under this Section. Organisers of pop concerts should ensure that they are doing all they reasonably can to protect the public. The organisers may have no employees on site but their duty to safeguard third parties will extend, for example, to providing relevant information to on-site workers about aspects of their undertaking that might affect their health and safety, such as emergency procedures. Contractors, for example, should consider what effects their work may have on the safety of the employees of other companies and on the public.

Section 4. The definition of 'premises' under HSW Act would include both indoor and outdoor pop concert sites. The primary responsibility for the elimination of risks will usually fall to the manager, owner, licensee and/or promoter, depending upon the contractual arrangements under which the pop concert is to be run. Control of premises may be shared between a number of parties. If this is the case, liaison arrangements will need to be set up to ensure that responsibilities are adequately identified and assigned.

Organisations and individuals who have control, to any extent, should consider what measures they can take to ensure that the site, access, plant and substances are safe.

Section 6 is particularly relevant to suppliers of plant, equipment or substances for use at work on the concert site. It also applies to designers and suppliers of plant or equipment for use by artistes etc. and to contractors who erect or install stages and sound systems.

Sections 7 & 8. The broad duties set out in these sections will apply to all employees at a pop concert site.

Entertainment Licensing Law

England & Wales

Under the Local Government (Miscellaneous Provisions) Act 1982 or, in Greater London, the London Government Act 1963, responsibility for controlling places which are used for public music and dancing and similar entertainments, including pop concerts, is vested in the district council or, in the case of London, the relevant London borough. It is normally an offence to organise public entertainment without a licence obtained in advance from the local authority, or to be in breach of any of the terms, conditions or restrictions the legislation empowers the authority to place on such a licence.

The purpose of this licensing regime is to ensure, amongst other things, that places of entertainment have adequate standards of safety and hygiene, and to minimise any possible nuisance which may be caused to the immediate neighbourhood. In considering public entertainment licence applications, the local authority will have regard to comments from the police and the fire authority, to whom advance notification of the application must be supplied.

The licensing of public entertainment applies to events held indoors throughout the country and also to those held out of doors in Greater London. Outside Greater London, licensing applies only to outdoor musical events on private land, and then only *if* the local authority has taken the necessary steps to adopt the relevant provisions of the 1982 Act.

Local authorities have very wide discretion over whether or not to grant entertainment licences and, in the case of indoor events or outdoor events held in Greater London, to attach to any licence such terms, conditions and restrictions as they think fit. For outdoor musical events on private land outside Greater London, the local authority may impose terms, conditions and restrictions on any licence it issues only for certain particular purposes which are specified in paragraph 4(4) of Schedule 1 to the Act. These concern: securing the safety of performers and other people present at the entertainment; ensuring there is adequate access for emergency vehicles and provision of sanitary appliances; and preventing unreasonable noise disturbance to people in the neighbourhood. It is, however, possible to impose a variety of terms, conditions or restrictions in respect of an event, provided that they all relate in some way to one of the purposes specified in paragraph 4(4).

The legislation which may be relevant in relation to licensing law includes:-

(i) Schedule 1 to the Local Government (Miscellaneous Provisions) Act 1982;

(ii) Schedule 12 to the London Government Act 1963;

(iii) Section 41 of the Civic Government (Scotland) Act 1982 (which have all been amended by Part IV of the Fire Safety and Safety of Places of Sport Act 1987);

(iv) The Licensing Act 1964, as amended by the Licensing Act 1988;

(v) local acts.

(vi) Private Places of Entertainment (Licensing act) 1967.

Scotland

Under the terms of the Licensing (Scotland) Act 1976 a licensing board may grant an entertainment licence for such an event. An entertainment licence relates to places of entertainment such as cinemas, theatres, dance halls and proprietary clubs and permits the sale or supply of liquor for consumption on the premises to persons frequenting them as an ancillary to the entertainment provided. A licensing board may insert conditions in such a licence to ensure that the sale or supply of alcohol is ancillary to the entertainment.

Outwith licensed premises district and island councils may grant a public entertainment licence for events such as pop concerts in terms of section 41 of the Civic Government (Scotland) Act 1982, but only in respect of events where members of the public attending are required to pay for admission. Where no charge is made the event cannot be licensed under the 1982 Act. The 1982 Act does not make it mandatory to license such events; licensing boards who have resolve to license, may attach conditions to the grant of licences including the start and finish time of the concert, requirements as to tickets, crowd capacity and crowd density and environmental noise levels (to be controlled in line with the Control of Pollution Act 1974). Such conditions are designed to ensure adequate standards of public safety with respect to the physical condition of buildings and their contents, fire precautions and procedures. Irrespective of the particular circumstances of any such event the organiser as the person responsible for arranging the event would require to comply with the statutory obligations imposed by the HSW Act.

Possible Areas for Licensing

Generally licensing provisions will be used to include matters such as the start and finish time of the concert; whether the concert should be all-ticket; whether the concert should be all-seated; crowd capacity and crowd density; environmental noise levels; numbers of sanitary conveniences; provision of disabled facilities; number of car-parking facilities; catering franchises; etc.

Overlapping Legislation

Sections 3 & 4 of the HSW Act, because of their wide scope, often overlap with other legislation. The Health and Safety Commission's policy is that, wherever possible, duplication of enforcement should be avoided. In many cases, enforcing authorities have reached agreement that the requirements of Sections 3 and 4 should not be enforced if public safety can be adequately guaranteed by the enforcement of other, more specific, legislation.

As regards pop concerts and similar entertainments, the licensing Acts may provide powers to make specific requirements. In this case, the licensing Act will normally be regarded as the more appropriate legislation.

Appendix 2

Enforcement of health and safety legislation

Responsibility for enforcing health and safety legislation in Great Britain is shared by HSE and local authorities. The premises where local authorities are responsible are determined by the Health and Safety (Enforcing Authority) Regulations 1989.

Who enforces?

Enforcement responsibility for health and safety legislation is determined on the basis of "main activity". The Health and Safety Commission's policy is that wherever possible health and safety legislation should be enforced in particular premises by one enforcing authority and there are powers which provide a simple administrative procedure to allow transfers between enforcing authorities. In practice, this means the enforcing authority will be either the Health and Safety Executive or the local authority.

Where the "main activity" is one which may be described as a leisure activity, which will include pop concerts, it is the responsibility of the local authority to enforce health and safety legislation, except where the local authority is the "occupier of the premises". In these cases the HSE is the enforcing authority because it is a principle that the enforcing authority cannot enforce legislation against itself. Where a pop concert is run at a site which is part of a larger commercial premises and the normal occupier of the premises is also running the concert, enforcement will be allocated to the authority which normally inspects the rest of the premises.

In the case of outdoor venues, it is necessary to consider when the local authority's enforcement responsibility begins. Prior to the actual event, the site may appear to be a construction site which would normally fall to HSE for inspection and enforcement. The site, however, becomes a pop concert venue when the promoter assumes responsibility rather than when the public arrive. From that time, all activities, with the exception of some aspects of construction work, will fall to the LA to enforce. In deciding whether the LA has responsibility for aspects of construction work, the Health and Safety (Enforcing Authority) Regulations 1989 should be consulted. For those aspects which would fall to HSE to inspect, such as structures, transfer to the LA may be appropriate.

Powers of Entry and Inspection

Health and safety inspectors have statutory powers of entry to relevant premises at all reasonable times. Obstructing an inspector, including inspectors exercising their powers of entry, is a criminal offence under the HSW Act.

Inspectors also have enforcement powers including powers to serve improvement notices which may require certain steps to be taken to achieve acceptable levels of health and safety. Inspectors also have powers to serve prohibition notices which can stop a work activity where, in the inspector's opinion, there is imminent risk of serious personal injury. Inspectors also have other statutory powers, including powers to take samples, photographs etc.

Failure to comply with an improvement or prohibition notice, or breach of the health and safety legislation, may lead to a criminal prosecution. It should be noted in particular that prosecution or indictment in the Crown Court can be punished with unlimited fines.

Appendix 3

POP CONCERTS CHECK LIST

Venue .... Date ......

Address ....
....

Telephone No .... Telex No .... Fax No ....

Concert Names/Addresses Tel/Fax No

1. Site owner.

2. Promoter.

3. Licensing Authority/Officer. Enforcing Authority.

4. Police.

5. Fire and Rescue.

6. NHS Ambulance

7. Voluntary First Aid Organisation.

8. Public Transport Organisation.

9. Site Personnel.

   (a) Security.
   (b) Scaffold.
   (c) Sound Engineer.
   (d) Lighting Rigs.
   (e) Electrical.
   (f) Sanitary facilities/washing facilities/plumber/cleaner.

(g) Merchandising.
(h) Crew Catering.
(i) Food and Drink Concessionaires.
(j) Car/Coach Parking.
(k) Refuse. Skip, Contractor/Site Cleaning.
(l) Star/Diamond Vision Screen Operator.
(m) Pyrotechnician.
(n) Laser Operator.

Action Checklist

1. Site Drawings/public parking.

2. Stage drawings. { } Test figures: Loadings ( ) Wind Tests ( ) BS.5975
Mix - Tower. { } Test figures: Loadings ( ) Wind Tests ( ) BS.5975
Delay - Tower { } Test figures: Loadings ( ) Wind Tests ( ) BS.5975
Disabled Platforms. { } Tset figures: Loadings ( ) Wind Tests ( )
Star Vision Platform.
Diamond Vision Units.

3. Structural Engineer - Documents send .... Date ....
Observations Received .... Date ....

4. Motor Test Certificates.

5. Flame Test Certificates.

6. Smoke Machines - Certificates.

7. Pyrotechnics - Company/Technician.

8. Lasers - Company/Technician. Certificate No .... PM.19.

9. Generators - Certificate No - 3 Phase /RCD /Earth Spike /
Earth Loop Monitor /Cable Routes - Ducts /Covers /
Buried .

10. Water supply to pit area - Taps/Cups.

11. Front of stage barrier - design/loadings.

12. Number of stewards.

13. Fire points. Backstage. Fire points/tenders.
Extinguishers on stage.

14. (a) Pressurised gas containers/apparatus siting.
(b) LPG storage - compound/vendors.

15. Emergency services liaison. Office - equipment.

16. Emergency procedure/loud hailers.

17. Signage - public highway
venue
Safety Signs Regulations 1980.

18. Public transport - signage/pedestrian access/public boarding points/barriers/temp lighting/road closures. Taxis/extra trains.

19. Ground control - assessed number of security personnel/stewards. High visibility clothing/numbers/register report time/briefing/information leaflets. Communications/radio channels. Venue PA system/control point.

20. Entrance - turnstiles/man/auto counters
box office
barriers
opening time.

21. First aid - organisations/locations/medical centre/telephones/drinking water/toilets/power/lighting/firstaiders/doctors/ambulances/hospital. First-Aid Regulations 1981.

22. Sanitary accommodation and washing facilities.

male WCs/urinals/wash hand basins
female/disabled/crew
step risers. Handrail/chemicals.

23. Noise control.

Monitoring point/power supply, equipment/staff/limit/noise sensitive developments

24. Security fences - perimeter/backstage area/type/lifting equipment on site
- availability.

HSE
Health & Safety
Executive

The Library
University of Southampton
Southampton
SO9 5NH

27 November 1991

Dear Librarian

GUIDANCE ON HEALTH, SAFETY AND WELFARE AT POP CONCERTS

HSE is currently preparing guidance for employers and inspectors on safety at pop concerts and similar events, which it is hoped will be issued in Spring or early Summer 1992. Before we do this, we wish to consult industry, local authorities and other bodies on the issues which need to be considered in running a safe event.

I am therefore enclosing a copy of the draft guidance which gives advice to employers on how to set up a safe system of work, a statutory duty under the Health and Safety at Work Act.

Following consultation, the draft guidance will be reviewed in the light of the comments received. It is intended that the guidance, when finalised, will be issued jointly by the Health and Safety Commission and the Home Office, which has responsibility for the legislation under which pop concerts are licensed.

In drawing up the guidance, it has been necessary to strike a balance between providing a very general description, which would rely largely on references to other published material, and providing detailed information which may not be necessary for an average employer involved with the pop concert industry. We hope we have struck this balance but we would like your comments on this. In a number of areas, where technical advice already exists, we have tried to distil the major points in the guidance while referring to the source, for those who need further detailed information.

You will see that in a number of places, gaps have been left in the text for illustrations. We intend to include these in the final text. We will also include an index and Annexes listing the publications and detailed regulations which apply.

We have been urged to ensure that advice given in the section on identifying hazards and defining safe methods is self-contained. This results in a certain amount of duplication. It does, however, help us to meet the needs of the different audiences who are expected to use the guidance.

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There are a number of particular issues where we would welcome a view. These are :-

Barriers

The crowd management section of the guidance contains advice on the use of barriers.(paras 150-171) The nature and location of barriers will depend on a number of factors, including the site or venue, size of audience, type of event etc. Where a front of stage barrier is necessary, we have recommended that, to ensure that the barrier does not turn over, there should be a minimum loading standard of 5kN/m right angle load at a height of 1.2m (para 158). Where a front of stage barrier is not provided, we have suggested that the stage front should be solid and should withstand a design load of 5kN/m (para 260).

Sound and noise levels

(i) Occupational exposure (paras 443-459)

The Noise at Work Regulations 1989 apply to all persons working at the events, and the guidance in this section is intended to help ensure compliance with them. Comments are particularly invited on the means for ensuring that musicians and other persons at work in this industry are protected to the standard set by the regulations.

(ii) Audience exposure (paras 460-469)

In making recommendations on protection of the audience from hearing damage, HSE has taken into account the more limited and irregular exposures which will be received and the individual's general right to engage in leisure activities carrying some risk. However, at the louder events, it seems right to ensure that the individual has the necessary information to decide whether to accept the exposure involved.

The draft proposes that sound levels in public areas should be limited to 104 dB(A) and that information should be provided to the audience on levels and potential risk when the level is likely to exceed 96 dB(A)(para 462). Comments are invited on this approach and whether the levels are appropriate.

(iii) Environmental noise (paras 470-476)

Guidelines are provided on the extent to which concert noise levels should be allowed to exceed background noise levels. Views on these recommendations would also be helpful.

All-seater accommodation (para 123)

The guidance suggests that where a concert audience is likely to consist primarily of children under the age of 16, the concert should be an all-seater event in order to assist safety management.

Outdoor Concerts: seating arrangements (paras 122-126)

The guidance suggests that seated accommodation at outdoor events may in certain cases cause problems. It is suggested that, in most circumstances, it is not appropriate to provide seating immediately in front of a standing audience. This can cause crowd management problems which may require a secondary barrier, with stewards, to be provided. It may also complicate the lines of escape for people in the main body of the audience. The effects of bad weather also need to be considered, as experience suggests that audiences tend not to remain seated when it is raining but move to other areas of the site.

Stewards (paras 172-191)

Successful management of pop concerts relies to a large extent on successful stewarding. At this stage, it has not been possible to develop a list of competences which stewards will need. The HSE intends, however, to flag up the need for guidance in this area with the relevant industry lead bodies set up under the National Council for Vocational Qualifications.

First Aid (paras 528-546)

The guidance contains recommendations for the minimum number of first aid staff, first aid posts and ambulances needed for events where disorder or other problems are possible (Category A) and for other events (Category B). Views on these suggestions would be welcome.

Children (para 114)

The guidance suggests that, at certain events, attendance of children, particularly those under the age of 5, should be strongly discouraged. It is possible for promoters and licensees of pop concerts to impose a contractual condition, as part of their sale of tickets, prohibiting young children from attending. Local authority inspectors also have powers under the Health and Safety at Work Act, to prohibit the presence of children (or other members of the public) in areas where there is a serious risk of personal injury.

High sound levels and very young children

During preparation of the draft, HSE received a suggestion that very young children should be banned from attendance at the louder events, for example by prohibiting persons less than 5 years of age attending concerts where the sound level is expected to exceed 96 dB (A). Comments are invited on whether such a prohibition should be introduced, what evidence of hazard to health there is to justify it, and the appropriate sound levels at which a prohibition might apply.

I should be grateful for comments by 31 December 1991. If you have any immediate queries, these perhaps could be resolved over the telephone or by correspondence: I suggest you contact either Alan Bell here on 071-243- 6369 or myself on 071-243-6629/6476. If you have any particular problems or general issues which you wish to discuss and would like a meeting, please contact Alan Bell.

Following this consultation, we will evaluate comments we have received and try to resolve, with consultees, any particular problems which arise. A final draft will then be put to the Health and Safety Commission and Home Office.

Yours sincerely,

Alan Bell

p.p. S O BULLOCK
Local Authority Unit